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NUTRITION IN HEALTH AND DISEASE*

BY

MAJOR-GENERAL SIR ROBERT McCARRISON, C.I.E., M.D., D.Sc., LL.D.,
F.R.C.P., I.M.S. (RET.), OXFORD

This is an historic occasion. The inauguration of the *Section of Nutrition* is the recognition by the Association that the science of nutrition is an integral part of medicine. Last among the sections, it is not the least; indeed, the day is not far distant when, instead of one morning being devoted to its work, it will rank with the section of medicine as a three-day fixture. For with the rapid increase in knowledge it becomes more and more apparent that the science of nutrition is the foundation of a more rational medicine. It is to be hoped that on future occasions the work of this section will not be limited to physiological, biochemical, pathological, and medical aspects of the subject, but that it will include those that are veterinary and agricultural.

Although young in years the newer knowledge of nutrition has already established contacts with, indeed embraces in its compass, every branch of our profession. It may, therefore, serve as a fitting introduction to to-day's discussion to indicate, though without aiming at completeness, what these contacts are; taking the nineteen other sections, into which the clinical and scientific work of the Annual Meeting is divided, as the basis of this survey.

First, then, in regard to *Medicine*, which heads the list of the sections, and with which *Public Medicine* and *Diseases of Children* may be included. What contacts has the science of nutrition established with medicine? This question can best be answered by defining "medicine" and by defining "nutrition." For the first definition we may look to a lay, or non-professional, dictionary, to find what the public expects of medicine. There it is defined as "the science or art of the prevention, treatment, and cure of disease"; not merely "any substance given for the cure of disease"; not merely "the science of the treatment of disease"; not merely "that branch of the healing art dealing with internal diseases." It is significant that in this definition prevention takes precedence of treatment and cure. Medicine is, in short, the science and art of maintaining health.

Definition

And what is "nutrition"? It is a fundamental function on which the condition of the body—that is to say, health—depends. It is not merely "food" nor "that which nourishes," as some lay dictionaries define it. Food is the instrument of nourishment; nutrition is the act of using it—the series of co-ordinated processes whereby the nourishment of the body is effected. It consists in the taking-in and assimilation through chemical changes—metabolism—of materials with which the tissues of the body are built up, their waste repaired, and their deterioration prevented; by which the processes of the body are regulated and co-ordinated, from which energy is liberated for the internal and external work of the body, and from which heat is generated for the maintenance of its temperature. A primary purpose of the function of nutrition is, thus, to establish and to sustain the structure and function of all organs and parts of the body: to keep, in short, the mechanism of the body in perfect running order. And since health, at its best—for it is a variable state of being—is that condition of body in which all its organs and parts are sound and perform their functions duly, easily, and satisfactorily, it follows that a primary purpose of the function of nutrition is to prevent, so far as its limitations permit, that disturbance or impairment of structure or function of organs or parts of the body which is disease. This, then, is the relation of nutrition to health and disease—the subject of our discussion to-day—the answer to the question: What contacts has nutrition established with medicine?

The older knowledge of nutrition showed the fundamental relations of the energy-yielding constituents of food to vital activities. It showed, also, the importance of the protein factor in nutrition. But it is only within recent years that the equally important relations of certain food-essentials—notably, mineral elements and vitamins—to the structural and functional efficiency of the mechanism of the body have received their due meed of attention. The study of these relations has led to a new conception of causes and origins of disease: a conception which may be summed up in the sequence—faulty food, faulty nutrition, faulty function, faulty structure, faulty health, disease. It is with this newer knowledge of nutrition, and not with the energy requirements of the body, that we are concerned to-day.

Factors Affecting Nutrition

Nutrition, as we all know, depends on a number of factors: the constitution of the food, the adequate oxygenation of the blood and tissues, the efficiency of the processes—digestion, absorption, assimilation, circulation, excretion—involved in this function, proper exercise of the body, rest and sleep, freedom from worry and emotional excitement, general hygiene, sunlight, and inherited characters. Chief among these is food of a constitution that provides all the elements and complexes needed for normal nutrition. Moreover, the lack or insufficient supply of one or more of these essentials, or their disproportion one to another, may be the determining cause of some of the other factors that adversely affect the function of nutrition, thus creating a vicious circle. Imperfect oxygenation of the blood and tissues may, for instance, be the outcome of specific food faults. Restlessness and excitement may be consequences of faulty feeding. Food of improper consti-

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tution may be the cause of impairment of any of the processes involved in nutrition. Defects in diet may enhance the harmful effects of want of sunlight. Food is thus the greatest of all factors on which the efficiency of the function of nutrition depends. It is the foundation of health; chief amongst the armaments of medicine against disease. "There may," as Holt aptly expresses it, "be normal nutrition without normal health, but there cannot be normal health without normal nutrition."

Here the question arises: what are the materials wherewith the function of nutrition is effected and whence are they derived? They are, so far as is at present known, oxygen, water, and the digestion products of proteins, fats, carbohydrates, mineral elements, and vitamins. There may be others, probably there are. So we are on surer ground when we consider the foodstuffs which, when properly combined in the diet, are known to ensure perfect nutrition and a high grade of physical efficiency and health in human beings. These foodstuffs are: (1) A good whole cereal grain or mixture of whole cereal grains or a good wholemeal bread. (2) Milk and the products of milk—butter, cheese, curds, buttermilk. (3) Egg. (4) Green leaf vegetables. (5) Root vegetables—potatoes, carrots, etc. (6) Legumes. (7) Fruit. (8) Meat. (9) Water. That these provide all elements and complexes, known and unknown, needed for normal nutrition is evident from the fact that they are the ingredients of the national diets of certain races of northern India whose physique and health, when they make use of their national diets in their entirety, are unsurpassed by any other races of mankind. Further, albino rats, when fed on a diet made up of these ingredients, can be maintained in perfect health.[1] Most of these foodstuffs are nowadays classed as "protective foods"[2]—a discovery made centuries ago by the races referred to, and of which the newer knowledge of nutrition has revealed the importance. If food be the foundation of health, these foodstuffs are its foundation-stones. Using them aright there is little need to concern ourselves too closely with the precise amounts of this or that chemical ingredient of food that may be necessary for normal nutrition. These foodstuffs provide them all and in due amount and proportion one to another. There is, however, this proviso, that they must be produced on soils which are not themselves depleted of essential plant nutrients or of substances, such as iodine, needed for the normal nutrition of man and animals and conveyed to them by plants. "Les plantes sont les enfants de la terre, de l'air, et du soleil"; and we, in common with other animals, are the offspring of the plants.

Here it may be remarked that important as properly constituted food is at every period of life, it is at no period so important as during infancy and childhood; for then it is that the body is being built, then that defects in its structure and efficiency are so readily established, defects that are at the root of many of the diseases to which man is erroneously supposed to be heir.

Bacteriology and Pathology

So much, then, for Medicine; now as to the contacts of nutrition with bacteriology and pathology. First, as regards the relation of nutrition to resistance to infection. Not long ago, Clausen submitted the available evidence on this question to critical analysis. His general conclusions were as follows:—

"Resistance to infection may be greatly reduced by deficient diet. A deficiency in the diet of vitamin A or of vitamin C appears quite definitely to lower resistance to infection. In certain cases a lack of the vitamin B complex may also do the same thing. A lack of vitamin D [*per se*] cannot be said to have a proven effect in lowering resistance [such lowering when it occurs is usually due to associated deficiency of vitamin A]. It seems probable that the existence of a partial deficiency [of vitamins] may result in loss of resistance to infection. . . ."

Under "deficient diet," as mentioned in these conclusions, there are to be included deficiency of protein and deficiency of certain mineral elements, notably calcium.

The contacts of nutrition with pathology may best be illustrated by the effects of faulty nutrition on the digestive and endocrine systems: the former a highly specialized mechanism designed for the nourishment of the body; the latter a highly specialized mechanism designed for the control and co-ordination of the round of chemical changes (metabolism) on which nutrition depends.

Gastro-Intestinal Tract

The discovery of the effects of deficient and ill-balanced food on the gastro-intestinal tract is "one of the most significant contributions to the rôle of nutrition in preventive medicine."[3] This discovery was made[4] by feeding monkeys on diets having a number of faults—poverty of vitamins and mineral elements and excessive richness in carbohydrates: faults common in human dietaries. "Deficient foods are in practice usually ill-balanced foods, and the effects of avitaminosis are bound up with maladjustments both in quality and quantity of other essential requisites of the food."[4] The health of the gastro-intestinal tract depends on the adequate provision in the diet of water, proteins, mineral elements, and vitamins. It is unnecessary to enlarge on the functions of water relative to digestive processes. In regard to proteins it is enough to say that they and their contained amino-acids are the sources from which hydrolytic enzymes concerned in digestion are derived and from which catalytic agents (glutathione, thyroxine, adrenaline, and insulin) are elaborated. As to mineral elements it needs but to recall that they enter into the composition of all cells, including those of this tract, that they control the permeability of cell membranes, the normal contractility of muscles, and the excitability of nerves, including those of this tract; and, that some enter into the composition of the digestive juices. Their adequate provision is therefore of the first importance to the efficient performance of the functions of the stomach and intestines. Vitamins of the A, B, and C classes have all a profound relation to the structural and functional efficiency of the alimentary tract. Witness the effect of deficiency of vitamin B_1 in impairing the motility of the stomach with consequent loss of appetite. Witness its effect in impairing gastric secretion and the normal rate of passage of the intestinal residues. Witness the effects of deficiency of vitamin B_2 on the health of the lining membrane of the tract. Witness that of vitamin A deficiency in favouring infection of it, an effect which it shares in common with deficiency of vitamin C and of the vitamin B complex. Witness the congestive, haemorrhagic and ulcerative lesions produced in it by vitamin C deficiency. Witness the experimental production by these means in animals of such lesions as gastric dilatation, gastritis, peptic ulcer, enteritis, and colitis (McCarrison, 1918, 1919). Witness the incidence of gastro-intestinal disease, amounting to 25 per cent. of all ailments, amongst insured persons in this country whose diets have so often faults of this character.

Diet and Endocrines

Consider the effects of faulty food on the endocrine glands: the sensitivity of the adrenals to deficiency of vitamins B and C; the sensitivity of the thyroid to deficiency of iodine, of certain vitamins, and of protein, and its reaction to certain excesses in the food, as of fats and calcium; the atrophic changes in the pancreas brought about

by carbohydrate-rich and vitamin-poor diets; the functional impairment of the reproductive function due to certain food deficiencies. Food deficiencies, as I pointed out many years ago, derange both the normal production of hormones and the functional perfection of sympathetic nervous control. Consequently, organs such as those of the digestive system are deprived of the full advantage of that efficient regulation and correlation which normally they would derive from healthy endocrine action. Fifteen years ago[4] I wrote as follows: "Especially do I direct attention to the effects of food deficiency on the digestive organs and on those endocrine organs concerned in the regulation of metabolic processes. These effects provide the pathological basis for attaching to food deficiencies a prominent aetiological significance in regard to that great mass of ill-defined gastro-intestinal disorders and vague ill-health which throngs clinics at the present day, and concerning which we have hitherto known little or nothing." I repeat this passage with the greater emphasis to-day, since the intervening years have provided abundant confirmation of its truth.

Obstetrics and Gynaecology

Contacts of nutrition with obstetrics and gynaecology are many. It will suffice to mention some of them: the impediments which the effects of rickets and osteomalacia may present to parturition; the relations of food, in particular of fats, mineral elements, and vitamins, to fertility, pregnancy, and lactation; the rôle of linoleic acid (sometimes called vitamin F) in favouring fertility; the probable effect of fat in facilitating the transference of vitamin A through the placenta to the foetus; the need for an abundant supply of vitamins A, B, and C and of calcium, phosphorus, magnesium, and iron to pregnant and lactating women, and their need for adequate supplies of vitamins D and E and of iodine; the rôle of vitamin E in preventing habitual abortion; the effects[5] of vitamin A deficiency on the reproductive tract—vaginal cornification, prolonged gestation, difficult parturition, uterine bleeding, variations in size of the placenta, tissue necrosis of the uterine wall—effects which in their turn may favour endogenous or exogenous infection. It is true that these effects have so far been observed only in rats, but it is well within the bounds of possibility that they may result in women from similar dietetic causes. It is significant that they occur in rats kept at levels of vitamin A deficiency insufficient to cause xerophthalmia. All these observations indicate the necessity for the proper feeding of prospective mothers, and of pregnant and nursing women: a necessity as much in the interests of the child as of the mother.

Surgery and Anatomy

In regard to surgery little need be said except that the need for it will lessen, certainly in the treatment of internal diseases, when the people learn to feed themselves properly and have the means to do so, and when the profession learns to lead them along the healthful ways of nutrition. The triumphs of surgery—and who would wish to minimize them?—are often the defeats of medicine. But as surgery was resuscitated, not so very long ago, by the application of the principles of antisepsis, so will medicine, now so dependent on surgery, be resuscitated by the application of the principles of nutrition. The relation of nutrition to surgical results, to the healing of wounds, to the mending of fractures, and to chronic bone and joint diseases needs no emphasis.

Coming now to anatomy: what relation has nutrition to this? Clearly an important one, especially in regard to the minute structure of the tissues of the body. "For however necessary a knowledge of normal structure of organs and parts of the body may be, it is not less necessary to possess a knowledge of the structural changes induced in them by so fundamental a factor as faulty food."[4]

Physiology

Physiology and biochemistry are so closely interwoven with the science of nutrition that they may be said to be departments of it. Their contacts with it are obvious. To biochemistry has fallen the task of isolating the vitamins: a task it is fulfilling with conspicuous success. There is, however, the risk that in the maze of vitamin and biochemical literature the practitioner of medicine may lose sight of the simple fact that all the body needs for perfect nutrition is provided in the relatively few foodstuffs already mentioned, if these be consumed in proper quantity and in the form in which nature provides them. Then the questions as to what vitamins, what minerals, what other substances, and how much of them are needed by the body are answered for him and more certainly than by biochemistry.

Nomenclature

Here some reference may be made to the nomenclature of the vitamins. These are still spoken of as "accessory food factors," as "anti-this" or "anti-that" deficiency disease. The time has come to disencumber them of these limiting descriptive terms. For they are not "accessories" but essentials, in no way subordinate to the other principles of food. They are substances indispensable to nutrition at every stage in its processes from appetite and the ingestion of food to the evacuation from the body of its waste products; substances without a sufficiency of which normal structure and normal function of organs or parts of the body cannot be maintained; substances as essential to the mechanism of the body as oil is to the mechanism of the car. It is true that they oppose the occurrence of this or that "deficiency disease"—a term that has also outgrown its usefulness—but they have, as I pointed out many years ago, much else to do besides the prevention of these maladies, and this much else their greater function. The main objection to the continued use of these terms is the impression they convey that because there is no xerophthalmia there can be no vitamin A insufficiency, or because there is no beri-beri there can be no vitamin B insufficiency, and so on through the list of "antis." It is the insufficiency, the inadequate ingestion, absorption, or utilization of the vitamins rather than their complete absence from the diet (an exceedingly rare event, even in the case of beriberi) that is of such importance in the practice of medicine. These terms were well enough as props to a dawning understanding of the rôle of the vitamins in nutrition. But now that the edifice of knowledge has come to rest on a sure foundation these props are no longer needed.

Psychology and Neurology

Nutrition has a close concern for psychological medicine and neurology.

"The rapid growth of the brain and the development of the nervous system render the growing child peculiarly susceptible to nervous disturbances, whenever conditions of life are such as to interfere with normal nutrition. Most of the neuroses of childhood depend entirely upon disorders of nutrition. The headaches, insomnia, disturbed sleep, chorea, habit-spasm, hysterical manifestations and a multitude of others are relieved only by correcting the faulty diet and habits which are the basis of the disturbed nutrition." (Holt).

The relation of nutrition to intelligence and backwardness in schoolchildren, the mental disorders in pellagra, the interdependence of physical and mental conditions, are other examples of the contacts of nutrition with psychological medicine.

It is now definitely known that deficiency of vitamins A, B_1, and B_2 has important relations to the development and health of the nervous system. A striking example of this truth is that afforded by the tissue-culture work carried out at the Nutrition Research Laboratories, Coonoor. There it was found that embryonic nerve tissue failed to grow normally in the plasmas of animals deprived either of vitamin A or of vitamin B. Among the effects on the nervous system of vitamin deficiencies are non-inflammatory peripheral neuritis; degenerative changes in the brachial plexus, sciatic nerves, sensory tracts in the periphery of the spinal cord, posterior columns and posterior nerve roots, Gasserian ganglion, and less commonly in anterior nerve roots and vagus. The nerve changes often present in pellagra in man, as well as the association of vitamin B_1 deficiency with beri-beri, with some cases of neuritis in pregnancy and, possibly, with alcoholic neuritis, are familiar examples of the contacts of nutrition with neurology.

In the field of ophthalmology the relation of night-blindness—of which there appear to be minor degrees more common in Western countries than was formerly supposed—xerophthalmia, and keratomalacia, to deficiency of vitamin A, is now well established. In connexion with it it may be recalled that the changes brought about by it in the conjunctiva appear to confer pathogenic characters upon otherwise harmless saprophytes present thereon; changes in the soil seem to alter the characters of the seed.

Orthopaedics and Radiology

Orthopaedics has contacts with nutrition that are exemplified in the results of rickets and osteomalacia. The fragility of bones, spinal curvature, displacement of vertebrae, diseases of joints, slow and imperfect mending of fractures, all caused, or possibly caused, by faulty nutrition, are other examples of these contacts. Here mention may be made of a case of spondylolisthesis, in a child of well-to-do parents, that lately came to my notice: an example, as it proved to be, of malnutrition in the midst of plenty and of the truth that it is not the food presented to a child but the food eaten and utilized that is of importance. In this case operation by bone-grafting was suggested for the correction of the deformity: a suggestion fortunately not followed; for the child made a complete recovery, as evidenced by an *x*-ray examination, after a year's proper feeding combined with properly directed exercises.

It is in such cases as this and in the detection of rachitic and other bony changes which might otherwise escape observation that radiology comes into touch with nutrition. Physical medicine does not, at present, appear to have any direct contacts with nutrition, yet the use of physical methods in endocrine disorders and in certain maladies that may have a malnutritional basis may not be without significance.

Oto-rhino-laryngology

Nutrition has a close concern for oto-rhino-laryngology, particularly in view of the changes brought about in mucous membranes by deficiency of vitamin A. These changes, which I shall have the opportunity to demonstrate to you this afternoon, are such as break down the local defences against infection, and may be of localized or widespread distribution. It is common knowledge that malnourished, weakly, and ill-conditioned children are peculiarly susceptible to inflammatory states of the nose, ear and throat. "It is almost impossible in winter to keep [such children] in a hospital ward more than a week or two without their developing rhino-pharyngitis, otitis, bronchitic or broncho-pneumonia" (Holt): a state of affairs recalling the "hospitalism" of the dark days of surgery prior to the advent of Lister. Such children frequently suffer from adenoids, which may possibly have a malnutritional basis, for I have myself observed the development of adenoid-like outgrowths in the upper respiratory passages of improperly fed rats.

Tuberculosis and Dermatology

Concerning tuberculosis and nutrition, one example will suffice: at the Papworth Village Settlement no child born there during the twenty years of its existence has, while a member of the community, contracted tuberculosis of the lungs, bones, joints, cerebral membranes, nor indeed any clinical form of the disease. Yet these children are the offspring of parents who suffer from tuberculosis and are in constant contact with them. How has this remarkable achievement been brought about? (1) By adequate nutrition, which maintains the child's resistance to infection, and (2) by the absence of mass dose infection—procedures which will prevent many other diseases besides tuberculosis. Here it is necessary to emphasize the relation of faulty nutrition to respiratory disease in general. It is a significant fact that one out of every ten sick persons amongst the insured classes in England and Wales suffers from such disease, and that rats fed on a diet in common use by these persons frequently develop such disease. Deficiency of vitamin A is particularly concerned in bringing this about.

In the domain of dermatology the effects of faulty nutrition on the skin are well recognized; semi-starvation, water deficiency, protein deficiency, mineral deficiency (particularly of iron, calcium, phosphorus, and iodine) and vitamin deficiency (particularly of vitamins A, B, and C) all have harmful effects on this organ and its appendages. Amongst them are dry and inelastic skin, roughening, atrophy, laxness, wrinkling, slow growth of hair, staring hair, loss of hair, slow healing of skin wounds, poor and imperfect cicatrices, furunculosis, ulcers, exudative skin diseases such as eczema and seborrhoea, the skin lesions of pellagra, oedema, xerosis, abscesses, inflammatory conditions at muco-cutaneous junctions, the papular condition known as "phrenoderma," hyperkeratosis, petechial haemorrhages and other scorbutic skin affections.

Therapeutics

It is in the domain of therapeutics that the newer knowledge of nutrition finds scope for practical application. "Formerly, in planning the patient's food, physicians thought solely in terms of the local pathological condition, of the harm they might do some impaired organ; now they think chiefly in terms of general physiology, of the good they can do the patient as a whole" (McLaster). It is in most cases the patient who must be treated rather than the disease from which he suffers, and in this treatment nothing is so important as maintaining nutrition. Witness the changes that have come about within recent years in the treatment of such conditions as typhoid fever, gastric ulcer, Bright's disease, hypertension, diabetes, tuberculosis, chronic arthritis, and eclampsia: a change based on the fundamental principles of the correction of food faults and the provision in proper amounts and proportions one to another of the various food-essentials needed for the maintenance of structure and function of organs or parts of the body. In the last resort the patient must, with remarkably few exceptions, heal himself, and it is by adequate nutrition that he can best be put in the way of doing so. Here the newer knowledge comes to the aid of the physician, enabling him, by means of refined preparations, rapidly to satisfy the needs of the body for substances that are in default, and thus to hasten cure.

Medical Sociology

The importance of nutrition in medical sociology is evidenced by the programme of work before that Section at the present Annual Meeting, wherein it is given a prominent place ; it will, then, speak for itself. But I am constrained in this connexion to refer again to the remarkable experiences of the late Miss Margaret McMillan mentioned in her book—*The Nursery School* (1930). Here she has described the weakly, ill-nourished, and ill-conditioned children of the slums who come for admission to the nursery school at Deptford: children who are rachitic and bronchitic; children with inflammatory states of the nose, ear and throat; children who have adenoids and dental caries. After they have been nurtured and properly fed for a few years they are, she says, almost all cured of any ailments from which they may have suffered on their entrance to the school. They are all straight and well grown, the average child is well made with a clean skin, is alert, sociable, and eager for life and new experience . . . "He does not need to see the doctor or the dentist, and he has none of the minor ailments which affect the children of the slums." Surely, we have in experiences such as this the root of the whole matter. We now know that large numbers of our people have not the means wherewith to provide themselves with proper food even though they had the knowledge to enable them to judge of what is proper; a state of affairs damnatory of our civilization. But it would be wrong to suppose that poverty is the only cause of faulty nutrition. "Access to abundance of food does not necessarily protect from the effects of food deficiency, since a number of factors—penury, prejudice, ignorance, habit—often prevent the proper use and choice of health-giving foods."[4] To these impediments to normal nutrition I would add indifference, neglect, and the weak indulgence of their children by many well-to-do parents which fosters tastes and habits detrimental to normal growth, nutrition, and health. Education of the people, the better education of ourselves: these are urgent necessities. It may be that the medical curriculum is already overgrown. If so, let it be pruned, let us teach the student less about "disease" and drugs and more about "health," more about nutrition, which is the very basis of health.

Medical History

I come now to the last of the Sections—that of the history of medicine. In this history no chapter is more romantic, more inspiring, more replete with hope for the future of our calling and for the well-being of mankind, than that dealing with the newer knowledge of nutrition. Its opening pages tell of the dawning idea of the relation of certain diseases, notably scurvy and beri-beri, to defects in food. These are succeeded by others describing the discovery of vitamins. As the story unfolds the numbers of these and of other elements and complexes, found to be necessary for normal nutrition, increase, and the conception of disease as a manifestation of disturbed structure or functions of the body consequent on faulty feeding and on the faulty nutrition resulting therefrom comes into being. Patient research, the discovery of facts, generalizations from facts, the prediction of fresh facts—its pages tell of these. These are the ways of science; these the ways in which the science of nutrition has been built up.

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ACUTE STREPTOCOCCAL INFECTIONS OF THE MIDDLE EAR*

BY

W. M. MOLLISON, C.B.E., M.CH., F.R.C.S.

SURGEON, EAR AND THROAT DEPARTMENT, GUY'S HOSPITAL

In my endeavour to find inspiration for the writing of this paper I turned to a discussion held in 1932 at a meeting of the Ear and Throat Sections of the Royal Society of Medicine. I doubt if I can add much of interest to what was stated then, and so I crave your indulgence. The wording of this discussion really includes all acute infection of the ear, because the streptococcus is the infecting organism in the vast majority of cases. The pneumococcus comes a poor second, and Pfeiffer's bacillus and the staphylococcus are bacterial curiosities.

Aetiological Factors

How does the streptococcus arrive in the middle ear? We shall hear from the subsequent speaker the frequency with which the streptococcus is found in the nasopharynx. Mr. Barwell stated in the 1932 discussion that

"spread of inflammation by the lymphatics or the blood vessels is so rare that it need not be considered in this connexion although it is possible for the ear to be involved in the course of a septicaemia of nasal as of any other origin, but ordinarily the inflammation reaches the ear, either by continuity along the mucous membrane to and along the Eustachian tube, or by discharges from a septic focus in the nose being blown through the Eustachian tube into the tympanum, without involvement of the intermediate tract of mucous membrane. The latter is, I think, by far the commoner method."

What Mr. Barwell said in 1932, laryngologists and otologists might well agree with in 1936. For my own part I am not convinced of the truth of the last statement in his remarks. I have had, however, one striking example of infection being blown to the ear. A doctor said "Good night" to a friend at midnight. He blew his nose forcefully, and immediately felt something go to his ear; he had a night of pain, and at 10 o'clock the next morning I opened the membrane and found pus. This is in my experience a rare occurrence; for such an accident to occur must there not be active inflammation in the nasopharyngeal membrane?

Further, I would like to mention the fact that the passage of the Eustachian catheter, and inflation of the tube through it, do not produce infection in the middle ear. Among the thousands of times I have used the catheter, only once am I aware of having started an acute otitis media, and I refuse to believe that my catheter has failed to encounter at least one streptococcus in its passage through the nose and nasopharynx. The case in which I did cause an acute otitis media was that of a child whose tubes I was inflating three or four times for catarrhal deafness; inflation was performed at 9.30 a.m., and at 9 p.m. incision of the membrane released pus. The child fell at a nursing home on a visit to a sick relation, and thus absolved me from blame for the otitis media!

By far the commonest cause of acute ear infection is an acute infection of the whole upper respiratory tract, such as the common cold, so-called influenza, tonsillitis, and streptococcal infections after removal of tonsils; should the antrum become infected, ear infection is more likely. When measles and scarlet fever are the cause of the mucous membrane infection the ear is very often involved. In the summer bathing in fresh-water baths is the common cause of acute otitis media.

* Read in opening a discussion in the Section of Oto-rhino-laryngology at the Annual Meeting of the British Medical Association, Oxford, 1936.

Dr. Lowndes Yates pointed out a long time ago that mucus was an antiseptic, and that if the mucus was removed or diluted it failed to keep the organisms in check. Fresh water is one of the worst offenders in diluting the mucus, and the two important ways by which the nasopharynx mucus is so diluted is by bathing in fresh-water baths and by using nasal douches, another cause of acute otitis media.

Lowered resistance due to other factors doubtless paves the way to streptococcal infection of the ears. Some American observers during the war undertook some entertaining experiments to find out what forms of exposure gave rise to "colds." Batches of recruits were placed in different conditions of discomfort; some were subjected to cold by inadequate clothing, some were made to go naked to the waist, and some had their feet kept constantly damp and cold. It was found that the incidence of infection was greatest among the last group.

In the same discussion Mr. Layton made a suggestion which attracts me very much. He thought that the virulence of the streptococcus might be enhanced by the presence of another micro-organism, or by the virus of the common cold or influenza. The following case may perhaps support this suggestion:

A young man suffered from staphylococcal septicaemia, under the care of a physician in Guy's Hospital. On three separate occasions *Staphylococcus aureus* had been recovered from the blood. He was extremely ill with a high fluctuating temperature rising to 103° F. To complicate matters, he developed double acute otitis media, both ears discharging pus; he became very deaf and his temperature rose higher still, to 104° F. It seemed that he would die unless something was done, and it was thought that the extra strain of pus in the ears was a factor that could be removed. Both mastoids were opened under gas and oxygen; both contained pus throughout. Cultivations from the bone on both sides gave a pure growth of the streptococcus. The man recovered with normal hearing.

It might have reasonably been expected that here at last was a blood-borne staphylococcal infection of the mastoids. This case may also be used as a strong argument against blood-borne otitis.

Perhaps another factor enters the picture: the anatomical arrangement of the Eustachian tube and middle ear. It is always stated that in children the tube is relatively large and short, but it may also be that in some the mucous membrane is more easily overcome—perhaps through some endocrine failure. Certain it is that some children and adolescents get a recurrent otitis media many times whenever they catch a cold or are exposed to cold and over-exertion. We have all known such patients, and I feel that when they get past a certain age they cease to be so affected. They "grow out of it," a good phrase often on the lips—perchance wise lips—of our forebears.

Prophylaxis

Prophylaxis as a logical outcome of aetiology therefore consists in keeping the nasopharynx reasonably clean by removing infected adenoids as well as septic foci in the nose and paranasal sinuses. Avoid bathing in fresh-water baths, and nasal douches; both are important in the case of subjects prone to colds or having a nasal or post-nasal catarrh. To avoid colds is impossible, but patients known to be susceptible to acute ear infections would do well to have a course of anti-catarrh vaccine treatment.

It is of much interest to note that persons who are found to carry haemolytic streptococci in the throat or nasopharynx are less susceptible to streptococcal infections. A Dick test will show whether a patient is susceptible to the haemolytic streptococcus, and these patients can be immunized against this organism. This is a commendable prophylactic procedure if patients, often children, are going to live in a community in which scarlet fever has appeared or "influenza" is prevalent.

Treatment

It is a truism that the severity of the illness of patients with acute streptococcal infections varies enormously. Mr. Layton, whose experience of acute haemolytic streptococcal infections in the specific fevers is unrivalled, states that he is unable to recognize clinically the cases that are not due to haemolytic streptococci. The patient may suffer from an acute otitis media which clears up in ten days, or may suddenly become acutely ill with what must be an acute toxaemia, or even septicaemia, of which the acute otitis and mastoiditis is only one manifestation.

During epidemics of influenza one has seen patients die in two or three days from meningitis secondary to ear disease. On one occasion a nurse was attacked by acute streptococcal infection, with acute otitis media and mastoiditis as the early sign; she then developed acute pericarditis, thrombosis of a mesenteric artery, and died in less than a fortnight. At the other end of the scale the patient is scarcely ill. A mild acute otitis media develops, the mastoid antrum and cells become infected without acute symptoms and, when operation is subsequently performed, recovery follows without causing the surgeon a moment's anxiety.

I do not intend to bore you by discussing in detail the treatment of acute otitis media and its accompanying mastoiditis. In spite of the tendency to leave alone the red membrane of otitis media, I am still in favour of incision in all cases of pain and obvious general bulging of the membrane if the temperature is high. In cases of general bulging there would seem to be a tendency for the occurrence of those very large perforations often accompanied by considerable deafness. Many cases of apparently mild otitis media under expectant treatment subside so far as the acute inflammation is concerned, but sow seeds of deafness which only becomes evident some years later.

I am not going to discuss when to operate on the mastoid cells, except to suggest that no uncomplicated case of acute mastoiditis ever required a midnight operation, and that this particularly applies to those acute toxaemic (? influenzal epidemic) cases. It is far better in these cases to tackle the patient instead of the ear, the procedure being to take cultures of the serosanguineous fluid, to give the appropriate serum, to take a blood count, and even to group the blood with a view to possible blood transfusion. The public has at last begun to realize that blood transfusion is not a last hope.

In the following case serum injection was given with advantage in a very acute streptococcal otitis media.

A boy was sent home from school because he had had a severe sore throat. He arrived at 3 p.m. feeling well, but half an hour later had acute earache. Two to three hours subsequently the boy was suffering from very severe pain, and the membrane was already red and bulging markedly. Incision released serosanguineous fluid under much pressure; there was already marked tenderness over the mastoid, and the temperature was 103° F. The same evening severe epistaxis occurred, necessitating plugging, and the boy felt very ill. The amount of discharge from the ear was so profuse that large pads of wool were soaked through quickly, and the pads had to be changed frequently. Professor Eyre saw the boy, and gave anti-scarlatiniform serum. This profuse discharge continued with high temperature and much malaise; on the third day the discharge began to be slightly purulent, and the mastoid operation was performed. Recovery was slow but uneventful.

Sometimes a blood transfusion may cure the patient without operation, even though tenderness is present. The following case is an example:

A boy, aged 14, had a so-called "Brighton" throat in 1931, with severe epistaxis, and headache over the right eye; he was very pale and the temperature rose to 102°. Pain in the right ear followed. The membrane was red and bulging, and already there was tenderness over the mastoid. On incision of the membrane a serosanguineous discharge escaped. In view of the boy's poor general condition and considerable loss of blood, a blood transfusion was given. Recovery was dramatic; in two days all tenderness disappeared.

Blood transfusions and pentnucleotide injections mark a great advance in the treatment of severely ill cases of infection; I have seen recovery accelerated and life saved by both procedures. Actually I am wondering whether pentnucleotide alone would not raise some patients' resistance so much as to avoid the transfusion.

Case 1.—A young man suffered from a mucopurulent discharge from the right ear for three months. A simple mastoid operation was performed, and pus was found throughout. The wound healed, but the ear continued to discharge. A further operation was performed, and small cells were found in the root of the zygoma; A few days later the temperature rose, and the patient became ill. Cultures from the blood produced a profuse growth of streptococci. A blood transfusion was given. Two days later there were streptococci in the blood, and after another two days streptococci were still recovered from the blood, but they were much fewer. The third culture of the blood produced no streptococci, but the white cells were only 4,000 per c.mm. There followed a third blood transfusion and a dose of pentnucleotide; and thereafter there was slow but steady recovery.

Case 2.—A boy, aged 11, had an acute mastoiditis for which operation was performed. Although the wound appeared satisfactory, and the ear discharge ceased, the boy complained of severe pain over the homolateral eye and temple. This headache continued at intervals for four weeks; it was so severe that he lay with his hand pressed on the forehead and temple and begged his mother to keep her hand pressed there too. Dr. Riddoch saw the boy and transferred him to London, where I was asked to see him. After discussion it was suggested that a condition of petrositis was the cause of the severe pain. The previous wound was opened, and pus was found in a cell at the apex of the petrous, from which a considerable amount of creamy pus flowed. The boy was still ill, and the blood count showed only white cells. Blood transfusion was performed by Dr. Knott, and a small dose of pentnucleotide was given. The improvement in twenty-four hours was dramatic, and a perfectly smooth recovery followed.

ACUTE STREPTOCOCCAL INFECTIONS OF THE THROAT*

BY

EDWARD D. D. DAVIS, F.R.C.S.

SURGEON, EAR, NOSE, AND THROAT DEPARTMENT, CHARING CROSS HOSPITAL

Acute streptococcal infection of the pharynx and larynx was known forty years ago as a number of different conditions. It was called acute septic inflammation of the pharynx and larynx; phlegmon of the pharynx and larynx; acute inflammatory oedema; erysipelas of these structures; and finally, phlegmonous cellulitis of the neck—that is, Ludwig's angina.[1] In 1895 Felix Semon read a paper at the Royal Medical and Chirurgical Society in which he argued that all these various forms of acute septic inflammation of the throat should be considered as varying degrees of virulence of one and the same pathological process. There is a great variation in the clinical signs and symptoms depending upon the severity and type of the infection, the resistance of the patient, and the situation of the lesion.

For clinical purposes two chief degrees of inflammation are recognized:

1. Tonsillitis, with considerable variation in the severity and in the extension of the inflammation and oedema to surrounding tissues.

2. A gangrenous inflammation, with a sloughing membranous exudate and toxaemic and septicaemic symptoms which often begins with acute tonsillitis, and is a later stage of the more severe types of the first group.

Symptomatology

There are many cases between these two somewhat extreme types. Tonsillitis is more common in children and young subjects. The septicaemic and virulent infection of the pharynx occurs in elderly patients, often as an intercurrent disease in such conditions as nephritis or chronic alcoholism. In the fulminating virulent cases the oedema spreads from the tonsils to the fauces and uvula, then down the lateral wall of the pharynx to the epiglottis and arytenoids. When the epiglottis or arytenoids are involved the pain and difficulty in swallowing are markedly increased, so much so that there is almost complete inability to swallow even saliva. In a very large proportion of cases the oedema is localized to the tonsils. A primary streptococcal laryngitis is rare, and is generally part of a pneumonia or is a direct extension from the pharynx. The epiglottis and arytenoids and soft tissues of the larynx became oedematous, and acute laryngeal obstruction may be expected. Alcoholic patients appear to be susceptible to this type of infection. Cervical adenitis is always present, and varies with the virulence of the infection. The more virulent cases show considerable swelling of the neck, Ludwig's angina, and may go on to suppuration. Though extensive adenitis means a severe infection, it also indicates a localization of the inflammation, and a general septicaemia is not so likely to arise. It has been noticed that when the tonsils have been enucleated, even some years before, the inflammation of the pharynx and the adenitis are more marked. Suppuration appears to be more frequent, but extensive adenitis occurs when the tonsils are present or absent.

Aetiology

The most common causal organism is the *Streptococcus haemolyticus*, which is found in the swab from the throat and in the severe septicaemic cases can be cultured from the blood. Streptococci and pneumococci are often found together in the normal throat, and both these organisms will often be present in septic conditions of the throat, so that it may be impossible to say which is the causal organism and which is the secondary invader, or there may be a mixed infection. R. G. Henderson has given a very useful account and summary of eleven cases of acute pneumococcal pharyngitis. I cannot do better than quote extensively from his paper published in the *Lancet*.[3] The pneumococcal case can be recognized clinically, but it requires the bacteriologist to prove the infection, and the co-operation of the bacteriologist is essential when serum is to be given. The typical pneumococcal case is of rapid and sudden onset, sometimes with a rigor. The patient looks and feels very ill, and has a high temperature and rapid pulse. The early oedema and redness of the throat is followed by a greyish-yellow membranous exudate extending on to the pharyngeal wall and uvula. Pain and the resulting dysphagia are very marked; the cervical lymphatic glands are tender and swollen. In the

*Read in opening a discussion in the Section of Oto-rhino-laryngology at the Annual Meeting of the British Medical Association, Oxford, 1936.

early stage, before the membrane appears, it is impossible to distinguish the pneumococcal tonsillar and faucial inflammation from that due to the streptococcus. In all the eleven cases the pneumococcus was the predominating organism in the throat swabs and in ten the organism was found in the blood, showing a pneumococcal septicaemia. All the septicaemic patients did not respond to treatment and died rapidly. The case which recovered was a Type II pneumococcus ; four cases were Type III, and six cases Type IV. Tracheotomy was performed on three patients, all of whom died. Anti-streptococcal serum and optochen did not have any beneficial effect.

In analysing sixty-six cases of acute laryngeal obstruction in infants Bradford and Leahy[4] found that thirty-eight were due to diphtheria and twenty-eight to the green streptococcus. In all the thirty-eight cases of diphtheria the bacillus was found, and the membrane was seen in thirty-one. In severe cases of diphtheria it is claimed that there is a mixed infection with the *Streptococcus haemolyticus,* but though the two organisms may be found together it is not known whether the streptococcus plays an active part.

Causal Factors and Epidemiology

Certain aetiological factors of streptococcal infections of the throat are well recognized. The spread of infection from one patient to another is perhaps the commonest. Small epidemics of tonsillitis are seen in residents, nurses, and students of a hospital. It occurs when a nose or throat operation is done during an epidemic of so-called influenza or of acute catarrhal infections, and it was particularly noticeable in the old pioneer days when a nose or throat operation case was admitted to a medical ward owing to the lack of provision of a sufficient number of beds for the ear, nose, and throat department. A severe streptococcal illness has resulted when a nasal or throat operation is done during or too soon after a bad cold or catarrhal infection, particularly too soon after measles. Sepsis following a nose operation has appeared as a severe streptococcal tonsillitis, and has sometimes led to other cases in the same ward—a strong indication that these cases should be isolated and certainly not be allowed in a surgical ward, and a plea for small wards of not more than ten beds, the rest of the floor being occupied by separate rooms and adequate balcony accommodation. There have been many epidemics of acute streptococcal throats traced to infected milk, and occasionally water, food, and feeding utensils. One of the best recent examples of milk infection is that of an epidemic at Brighton at the end of 1929.[5] Patients were of all ages, but it was noticed that many of them were round about 60 and 70, and the epidemic was localized to Brighton and Hove. It took the form of severe follicular tonsillitis, frequently accompanied by the formation of a false membrane, or a second type of case was seen which resembled virulent diphtheria with a membranous exudate. Glandular enlargement was more marked than in ordinary tonsillitis, and in a few cases gland abscesses resulted. Relapses were common, presumably due to repeated doses of the infected milk. Septicaemic complications, such as pneumonia, peritonitis, nephritis, and arthritis, occurred in a few patients, but apparently otitis media was conspicuous by its absence. The source of infection was traced to one dairy. Several doctors made the observation that those patients who had had enucleation of tonsils were more severely infected than those whose tonsils were present.

Scarlet fever should always be remembered when a child is seen with a virulent tonsillitis and adenitis, particularly when it is accompanied by vomiting and there are other cases. There have been several epidemics of haemolytic streptococcal infection of the throat in schools which did not resemble scarlet fever, but were ultimately proved to be an unusual and atypical form of it. A few sporadic cases of tonsillitis can be traced to bathing in polluted water. This type is generally a diffuse infection of the throat and nose, and otitis media follows. It is seen during a spell of hot weather when bathing pools are overcrowded. It is remarkable that these cases are so few; the resistance of the average bather must be high. Time will not permit me to indicate the methods now employed to prevent this type of infection. Small epidemics of severe tonsillitis have occurred among passengers in cruising ships, and it is difficult to trace the source of infection, which may be caused by water, food, the swimming pool, or spread from one patient to another. Some of the most severe streptococcal throats follow the extraction of teeth.

Treatment

Streptococcal infections of the throat, even when they appear as an ordinary tonsillitis, demand careful treatment, and must be regarded as serious. Skilful nursing, both day and night, is essential, and there is no illness in which the active co-operation of the bacteriologist, surgeon, and physician is so necessary to ensure a successful result. Swabs of the throat must be examined, blood cultures taken, and blood counts done. If there is any question of diphtheria serum should be given at once without waiting for the bacteriological report. On the other hand, it is useless to give anti-streptococcal serum if the infection is due to the pneumococcus. Blood transfusion and immuno-blood transfusions may be necessary. It appears to be universally accepted that anti-scarlatinal streptococcal serum should be given in large doses in streptococcal infections. Some find anti-diphtheritic serum of value even when the Klebs-Loeffler bacillus is absent. Felton's pneumococcal serum is suitable for infections due to the pneumococcus Types I and II, but only one of Henderson's eleven cases was due to Type II ; the rest, all fatal, were due to Types III and IV.

The physician may be called upon to treat heart failure, pneumonia, etc. A calomel purge is a favourite start. The surgeon-laryngologist not only may have to deal with suppuration and abscess formation, and perhaps perform tracheotomy, but he has to relieve the patient of his distress and painful symptoms. Gargles are painful and of little value. The throat has to be cleaned by gentle swabbing with hydrogen peroxide, followed by spraying with a mild antiseptic solution made up with glycerin or paraffin. It is useful to spray the throat with a 1 per cent. solution of cocaine before swabbing, and before food or swallowing. The insufflation of orthoform and anaesthetin powder is innocuous and relieves pain. If the patient cannot sleep there is no objection to doses of morphine and atropine given hypodermically, provided there is no oedema of the larynx and no abscess which is likely to burst ; Dover's powder or aspirin is also very useful. Hot applications in the form of an electric heating pad to the neck, or the inhalation of steam in the form of friars' balsam, are comforting. I have found a mixture of potassium chlorate and sodium salicylate helpful, and it has a beneficial effect on the adenitis. The patient should be encouraged to take as much fluid as possible, and intravenous glucose by the drip method is of undoubted benefit. Various bactericidal compounds are disappointing. Professor Horlein has advocated the use of a dye compound, prontosil, which is said to render streptococci more susceptible to phagocytosis.

Complications

The complications of the acute streptococcal infections of the throat are numerous, particularly in cases of a septicaemic nature. The throat condition may also be a

part of a general infection. Lemierre has described cases of septicaemia due to anaerobic organisms occurring in young adults, sometimes in small epidemics, in which the most usual initial cause was a tonsillar or peritonsillar abscess opened too late or to an insufficient degree. These septicaemias are considered to result from a thrombophlebitis of the tonsillar and peritonsillar veins, which can spread to the internal jugular vein or even the facial vein. The first sign of septicaemia is a rise of temperature to 102° F. with a rigor, usually on the fourth or fifth day after the initial sore throat. The rigors may be repeated daily, and adenitis is often severe ; the *Bacillus fundibuliformis* may be cultured from the blood. Septic infarcts and arthritis arise, and the organism can be found in the metastatic abscesses. Certain German observers[7] have ligatured the jugular vein on the side of the affected tonsil as soon as the clinical diagnosis was possible, and without waiting for the result of the bacteriological examination. They claim that ligature of the vein has diminished the mortality. Lemierre[6] had one case in which the jugular vein was ligatured, but it did not prevent a fatal termination. For the sake of brevity only those complications which concern the laryngologist will be mentioned.

1. Abscess formation in connexion with the tonsil, which is of better prognosis than a cellulitis without suppuration. The usual supratonsillar fossa abscess deep to the upper pole of the tonsil is opened and drained by a crucial incision, but when the abscess is deep to the lower part of the tonsil, or a posterior tonsillar abscess deep to the lateral wall of the pharynx is present, further operative treatment than incision may be required.[8] A total enucleation of the tonsil has been done.

When repeated incisions have failed to find pus, and when drainage is not good in a patient who has a high temperature and whose general condition is unsatisfactory there may be :

2. A general infection with haematuria, albuminuria, oedema of the larynx, thrombosis of the jugular vein, and general sepsis.

3. The presence of either a parapharyngeal abscess in which the pus has tracked into the deep fascial planes of the neck, or suppuration of a lymphatic gland.

When the abscess or cellulitis occupies the central fascial compartment near the carotid vessels, violent and fatal haemorrhage has occurred as the result of erosion of the jugular vein or carotid arteries. Erosion of the jugular vein is said to be more common in scarlet fever.

TONSILLECTOMY

Tonsillectomy during the acute state is not popular because it is not without risk, and there is the danger of a considerable increase in sepsis. Haemorrhage at the time of the operation and after is severe, and difficult to control ; the tonsillectomy is also difficult, and often inefficient and incomplete. Local anaesthesia is advisable, and if employed the operation may be painful owing to lack of infiltration of the anaesthetic solution. Canugt[9] and Reidar Schroeder prefer to dislocate the upper pole of the tonsil or to remove it—that is, do a partial tonsillectomy and so drain the abscess. This is followed a few days later by tonsillectomy in the tepid or cold state. It has the advantage of allowing the surgeon to pack the cavity behind the tonsil in cases of haemorrhage. The injection of a local anaesthetic through the anterior pillar just above the last mandibular molar abolishes trismus. Schroeder of the Sundby Hospital, Copenhagen, states that of 148 tonsil abscess cases ninety-two were treated by incision and required no further operative treatment ; fifty-six were treated by further operation ; in fifteen no pus escaped on incision and the temperature remained high ; thirteen had nephritis ; eleven oedema of the glottis ; seventeen lateral pharyngeal or posterior tonsillar abscess ; and there were two cases only of lateral sinus thrombosis.

Total tonsillectomy has been performed to arrest haemorrhage resulting from a tonsil abscess. The internal carotid artery and the jugular vein have been eroded by tonsillar and gland abscesses. Such a catastrophe demands a bold and prompt decision, and still more rapid ligature of the eroded vessel. This fulminating haemorrhage is more common in cases of posterior or lateral retropharyngeal abscess and in children. In this country, except in cases of haemorrhage, there is little opportunity of enucleating tonsils during the acute stage of tonsil suppuration, but it must be remembered that a large number of successful cases of total enucleation of the tonsil during the acute stage have been recorded.

CERVICAL ADENITIS

Cervical adenitis is nearly always present during a streptococcal infection of the pharynx, and in a number of cases suppuration has followed. The glands should never be incised before it is reasonably certain that an abscess is present. Too early incision does more harm than good. Abscesses in the neck arise by suppuration of lymphatic glands or by direct extension from the tonsil through the pharyngeal wall, or they are blood-borne, in which case there will be thrombosed veins. The pus is usually found in the visceral or central fascial compartment along the carotid sheath, or in front of the styloid process and its muscles deep to the submaxillary gland. More rarely the glands in front of the trachea near the isthmus of the thyroid gland suppurate. Some abscesses tend to point at the posterior border of the sternomastoid. An abscess in the central compartment has led to fatal mediastinitis. When an abscess is present it should be freely opened with a knife with as little trauma as possible—that is, a careful dissection should be made down to the abscess, which is often deep to the muscular planes, and any loculi gently broken down with the finger. The finger is a better instrument than a sinus forceps. Free drainage should be established by a well-planned incision and counter-incision rather than by thrusting in a drainage tube. Epidemics of acute streptococcal adenitis have occurred in children during the influenza season.[11 12] The illness commences with a high temperature, rigors, and a diffuse adenitis, and very little can be found in the throat beyond a slight diffuse catarrh ; a very few cases of acute tuberculous adenitis in young children have been known to be similar in onset ; a swab reveals a haemolytic streptococcus. Blood culture is negative. The acute stage of the illness appears to be over in about ten days, but relapses with a high temperature are frequent, and the illness is prolonged from four to five weeks. Complications such as bronchopneumonia, nephritis, and otitis media have been recorded ; suppuration is uncommon. Anti-streptococcal serum has no beneficial effect.

OEDEMA OF THE LARYNX

Oedema of the larynx accompanies the fulminating types of infection of the throat, particularly when the epiglottis and arytenoids are involved. An inspection of the larynx should always be made, and a careful watch for oedema should thus be a routine. At the first sign of any laryngeal involvement tracheotomy instruments and a syringe charged with a local anaesthetic should be at hand. If the patient is not on the same floor as the operating theatre a table and sandbag should be placed ready in the room, with a good light. Laryngeal obstruction is often rapid and dramatic in its onset, especially if there is any heart failure, which adds to the oedema. These fulminating cases in which tracheotomy has to be per-

formed are nearly always fatal, in spite of the relief of the laryngeal obstruction. Every effort should be made to avoid tracheotomy, but delay is sometimes dangerous.

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THE HAEMOLYTIC STREPTOCOCCUS:

WITH SPECIAL REFERENCE TO SCARLET FEVER*

BY

DUNSTAN BREWER, M.R.C.S., L.R.C.P., D.P.H.

M.O.H., SWINDON

I appreciate with real sincerity the honour of your invitation to open this important discussion, for you know that I have nothing new to tell you; I can claim to know nothing of the subject which is not better known to many of you, and very little which is not known to all. So the fruitfulness of this meeting will rest not upon what I say but upon what you say, and my task is the easy one of getting you going.

We are about to discuss one of the most important subjects in medicine, for to the European the streptococcus is public enemy No. 1, and deep down in the minds of all is the conviction that we ought to be able to circumvent it. We have given up the idea of exterminating, or incarcerating it, but we believe, with much reason for our belief, that we can manage to make it live amongst us as a respectable citizen.

Forty years ago I gained a prize for an essay on the streptococcus which covered a full sheet of foolscap! Since then knowledge of the varieties and attributes of this organism has grown so much that in the *Annals of the Pickett-Thomson Laboratory* it commands eight large volumes; the literature dealing with it and what it does to man would fill a respectable library. But recently those streptococci which interest us have been found to be of more manageable proportions, and from Dr. Dora Colebrook's report, which is the latest word on the subject, we can reduce the varieties of streptococcus important to human pathology to some dozen or so.

Although during the past fifty years there has been a dramatic decline in the prevalence and fatality of the acute diseases, the ravages of the streptococcus have increased. Alone of all the important causes of death, fatal streptococcal infection shows an increase which is exalted on standardization. But it is not only as a lethal agent that the streptococcus is important to us; it is the commonest of all causes of temporary inconvenience, and also of permanent defection from normal health. Probably nobody in temperate climes passes through life without paying some tribute to the great enemy; none of us knows when he may next be called upon for a contribution, the amount of which cannot be foreseen. We in this room can have some assurance that we shall not suffer from most of the diseases caused by parasites, but from those due to the streptococcus we have none, yet it is in the minds of all of you, as it is in mine, that this ought not to be; that the enemy is not so elusive that it is beyond our powers to keep it at bay. So far we have failed, but our failure has been by no means complete. In many ways what has disappointed us opens up new hopes of an eventual success greater than any we have visualized in our limited endeavours of the past.

Varieties of Infection

The diseases caused by the streptococcus fall into two groups: (1) the three notifiable diseases, scarlet fever, erysipelas, and puerperal fever; and (2) a miscellaneous group embracing almost every form of sickness from which we suffer. But multifarious as are the manifestations of streptococcal infection, they are all so similar fundamentally that the clinicians preceded the bacteriologists in separating them from sicknesses caused by other parasites. Any and all of the forms of disease dependent upon streptococcal infection can be caused by any or all of the varieties of the parasite known to be pathogenic to man, though in certain types of lesion certain varieties of parasite are more frequent than others. From this it would seem that our attack upon the streptococcus must be generalized, though without doubt we must employ many different arms to win the battle.

The reservoir of the haemolytic streptococci pathogenic to man is the human nasopharynx; elsewhere it is found only in lesions caused by it. Epiphytic streptococci found on other parts of our surface are not pathogenic, nor are streptococci from extra-human sources, unless these have been recently distributed from a human carrier. The pathogenic varieties are found in from 1 per cent. to 100 per cent. of healthy pharynges according to season, period, and locality. It is questionable whether they are more frequent in unhealthy or convalescent throats than in healthy throats. They can, of course, always be found in the throats of scarlet fever and streptococcal tonsillitis patients, and for a short time after the reaction has subsided, but I doubt if true carriers are more common in those who have reacted than in those who have not. By a healthy throat I mean one which functions sufficiently to enable its possessor to get about his business without knowing that he possesses a throat, unless he thinks about it. In the prevention of massive infection, three things stand out clearly—the use of masks in surgical operations, even of a trivial character, and in midwifery; the relative isolation of those likely to be discharging the parasites profusely; and the adequate spacing of all sick persons, especially of those suffering from sicknesses in which an added streptococcal infection is most to be feared. These are old measures, sound in theory, and of proved efficiency in experience.

The virulence of the pathogenic streptococci appears to be exalted by passage through a host for other hosts similarly circumstanced. This is most obvious in localized outbreaks of puerperal fever and erysipelas, but is seen in all streptococcal diseases—for example, in peritonitis following clean operations. This exalted virulence seems to be specific. It is evidenced by shortening of the incubation period, rapid invasion of the tissues, and heightened fatality. In outbreaks of puerperal fever the virulence is enhanced mainly, if not exclusively, for puerperal women, not for their attendants.

During the last few years I have had the opportunity of studying the interaction of scarlet fever and the puerperium and have formed the following conclusions—at present held tentatively.

1. Parturient women are just as likely to suffer from scarlet fever as are non-parturient women.

2. If the implantation is at the normal site—the throat or nose—both scarlet fever and puerperium run their normal courses.

* Read in opening a discussion in the Section of Public Medicine at the Annual Meeting of the British Medical Association, Oxford, 1936.

3. If the site of implantation is the genital canal the result is serious, for metritis, pelvic inflammation and/or septicaemia may ensue. The explanation of this is simple. If foreign strains of streptococci are implanted on the throat, they meet with structures with an inherited potential to react to them; if they are implanted on a site to which normally they do not wander, there is no such protection. Septic metritis of the delivered uterus is a much more serious matter than tonsillitis, and pelvic cellulitis than cervical adenitis, although pathologically they are essentially similar. Moreover, during or immediately after delivery there is recent trauma, allowing direct entry into the blood stream of any organisms implanted on the surface. Yet surgical scarlet fever due to implantation of the streptococcus upon wounds and burns is generally trivial.

Scarlet Fever

Of the diseases of man caused by streptococci, the most frequent, but the least serious, is scarlet fever. During recent years the notifications of this disease have been about one-fifth as numerous as the registered live births. Since many cases are not notified because they are not detected, we shall probably not be in error in stating that one person in four goes through an attack of clinical scarlet fever. The damage done by scarlet fever is great, but, considering that about 100,000 cases of scarlet fever are reported yearly in England and Wales, it is relatively surprisingly small. It is fourteen years since 1,000 deaths attributable directly to scarlet fever occurred in one year; in 1934, the year of highest mortality since 1923, the total deaths were 963. A fatality rate above 1 per cent. is now quite uncommon, but this does not include fatality from otitis, nephritis, and carditis which kill remotely but more frequently than does the parent disease in its acute stage.

So far as we can judge from our records, the incidence of scarlet fever, though it varies much from year to year, has not varied from period to period, but its fatality has altered almost sensationally during the lifetime of our more elderly members. At the end of the last century, fatalities of 10 per cent. were not uncommon, and a generation before that, the disease was even more fatal. We should be inclined to look upon the reported fatalities of former times as biased from failure of notification of mild cases were it not that a fatality rate of 10 per cent. is still found in South-Eastern Europe, and the septic and toxic cases which were frequent in the past are now seen but seldom. What has caused the fall in scarlet fever fatality we do not know. Charles Chapin of Providence believes that it has come about from hospitalization of the severe cases producing a kind of eugenic breeding out of streptococci unfavourable to man; but if this were so, why should the loss of fatality be limited to scarlet fever? It is not shared by other streptococcal diseases.

The geographical distribution of scarlet fever is interesting. It becomes progressively rarer as we approach the equator. At Nairobi, in Kenya, there have been but three notifications of scarlet fever in the history of the municipality, and elsewhere in the tropics the disease is negligible. It is almost, but not quite, limited to Europeans, a phenomenon the reverse of what we should expect in a white man's disease introduced into native populations. This comparative immunity of the dark-skinned races is not limited to scarlet fever, but extends to all streptococcal diseases. Puerperal septicaemia is hardly more common in India, or Africa, than it is in England, though if English women were confined as are their Indian sisters we should expect a very high fever rate.

Since scarlet fever may be caused by any type of pathogenic streptococcus, and these types produce different antigens which call forth different antibodies, we should expect scarlet fever to be a recurrent disease. As you know, it is not, although of all the diseases which were formerly called zymotic, it is the most likely to recur, and the relapses which we see not infrequently are suspiciously like new infections. It is, however, only in the rash phenomenon that scarlet fever is not recurrent. Streptococcal tonsillitis, liable to be followed by complications identical with those of scarlet fever itself, is recurrent, and the diagnosis of this from scarlet fever without eruption is to make a distinction without a difference. Although scarlet fever has fallen greatly in fatality and, in spite of some local threats, shows no sign of becoming more lethal, it has not altered in type; there is no complication which occurred in the old days which is not seen to-day; there is nothing seen to-day which was not seen by our fathers.

Does an attack of scarlet fever confer any immunity against other streptococcal diseases? Presumably it should give fairly good protection from future assaults of the type of streptococcus which caused it; those who believe in the existence of non-specific antibodies would surely expect complete immunity to one type of streptococcus to give something valuable in resistance to other types nearly akin? This is a point not for philosophical speculation, but for deduction from clinical experience. For many years I have been building up life histories of all citizens in the town in which I work, one object of which is to obtain evidence of the influence of past disease upon the future life of the recoverer. Obviously I can never hope to answer the questions at issue, but they may be answered in course of time. The evidence so far available suggests that an attack of definite scarlet fever does do something to protect against future invasions of streptococci.

Though we do not regard scarlet fever as a specific disease, it has many of the clinical features of specific infections, and superficially appears to have their epidemiological characteristics also, for scarlet fever appears in periodic epidemics much resembling those of measles, small-pox, or typhoid fever. But if one has the opportunity of watching a population through an epidemic period, one finds that notified scarlet fever is not the whole, but a part of a more extensive biological event. It is well known that epidemics of scarlet fever are frequently accompanied by an excessive prevalence of tonsillitis, but evidence of exalted activity of the streptococcus can be found in other directions, although, since other streptococcal diseases are rare in comparison with sore throats, their unusual prevalence will not be obvious unless it is sought, and in few districts will the medical officer of health be in a position to estimate the local and topical variations in the prevalence of non-notifiable streptococcal diseases.

Whilst I have observed that in times of epidemic prevalence of scarlet fever other streptococcal diseases are dominant also, I have observed the converse, namely, that when the epidemic ceases a period of comparative freedom from streptococcal diseases of all varieties follows. I admit that, even if the observation is accurate, its explanation may be not a temporary exaltation of immunity, but a temporary scarcity of streptococci. For we know that the supply of the parasites in their natural reservoir—the human throat—is subject to periodical variations.

What is the connexion between scarlet fever and acute rheumatism? I put forward the proposition that acute rheumatism—which is badly named, for it is seldom acute and rarely rheumatism—cannot be separated from scarlet fever; they are both different manifestations of the same biological process. So I expect it to be found eventually that strains of haemolytic streptococci identical with those which cause scarlet fever are the causal parasites of acute rheumatism.

Erysipelas

Erysipelas is one of the few diseases that we can recognize in the Hippocratic collection, and it appears to have varied little in historic times. It was made notifiable in England and Wales by the Act of 1889, and since then has been notified as accurately as any disease. Its incidence is extraordinarily even ; in recent years it has varied from 13,000 to 20,000 cases per annum, giving an incidence of about 0.35 per 1,000. But its fatality has been increasing, the deaths in 1934 being nearly double those in 1924. In 1926 and 1933 there were 14,581 and 14,515 notifications, respectively, but the deaths in the former year were 807, in the latter 1,191. Part of this increased fatality disappears on standardization, but not all of it, so we must acknowledge that improvement in treatment has lost in the struggle with increasing malignancy.

The same may be true of the much-discussed puerperal fever. This again can be recognized in the Hippocratic collection, and appears also never to have been different from what it is to-day. Though compulsorily notifiable since 1889, notification until quite recently was totally unreliable, but the mortality from the disease has remained constant. Speaking with great reserve from my own experience, I think its incidence has increased during the past forty years, but its fatality has declined, leaving the mortality constant. We seldom see epidemics of this disease to-day, but I think the sporadic cases are more numerous than they were.

Other Streptococcal Lesions

Of the less well-defined forms of streptococcal disease we cannot speak very definitely, for until recently infections of wounds and surgical operations and acute inflammations of the throat and respiratory tract were rarely bacteriologically differentiated, so we do not know if these septic processes were in the past similar in parasitic causation to what they are to-day. Streptococci can be found in most lesions, for there are numerous types which are universally epiphytic on man, but, since only a few types are pathogenic, the mere presence of streptococci tells us little or nothing. Streptococci which are avirulent can be recovered from any catarrhal and most healthy surfaces. They may wander into wounds and sinuses, and towards the end of life even into the blood stream ; so we must not call all disease processes streptococcal because streptococci can be recovered from them. In this, as in so much else in medicine, the greatest misleader of the physician is slipshod clinical pathology.

Immunization and Treatment

Faced with a disease which is not only common and formidable but which appears to be winning the race against our efforts to stem it, we naturally look about for some new or improved means of attack. In accordance with the trend of medicine during the past fifty years, we first look to the laboratory for help. Recently the bacteriologists have reduced the numbers of varieties of the streptococcus important to human pathology to about a dozen. The feasibility of conferring artificial immunity to this group is therefore promising. But, unfortunately, immunity to streptococcal disease is of a very different order from that to toxaemias, to virus diseases, and to those dependent upon bacillary invasion.

It seems that immunity to the streptococcus is largely local, and strains innocuous at a site where the host has previously reacted to them may be dangerous at a fresh site. This makes things awkward. Immunization against scarlet fever has been practised for many years with some success, but the immunity conferred appears to be limited to the toxaemia of scarlet fever, and lacks proof of influence upon the liability to other streptococcal diseases. Passive immunity to toxaemia and also the abolition of toxaemia should it occur can be obtained by anti-scarlet serum, but evidence that this passive immunity protects against streptococcal invasion and septicaemia, which are the real dangers, is not encouraging.

Anti-scarlet-fever serum is used as a prophylactic against puerperal fever, but most of us are sceptical of its value. In treatment, anti-scarlet serum has superseded other streptococcal antitoxins, a point of some significance. Its use is now fairly general in scarlet fever, though there is much variation in its exhibition. In erysipelas and puerperal fever it is not so popular, but many of us try it with high hopes which are not always disappointed. In surgery and general medicine its use is irregular, but it might be used more for tonsillitis, in which disease its action is often striking. How far it has been employed by others for acute rheumatism I do not know, but recently I have used it for rheumatic carditis and other complications of child rheumatism with results that have decided me to persevere. Generally this serum seems to counteract toxaemia, but it is without influence upon invasion, which is the chief danger of streptococcal infection. In uncomplicated scarlet fever its action is quite dramatic, but there is much doubt whether it does, or does not, influence the complication rates. It undoubtedly cures all streptococcal diseases which will get well of themselves, but whether it can avert fatality is uncertain, though we believe that it does so occasionally.

From what I have said you will not accuse me of gross optimism, but I believe that if we use our wits and our energy we shall conquer the streptococcus, although the conquest will neither be speedy nor dramatic. The matter calls for much patient inquiry and intelligent and honest trial in the field of the products of the laboratory. May I recall to those of my own age what happened rather more than forty years ago when the two greatest remedies of modern medicine—diphtheria antitoxin and tuberculin—were discovered? Did we not all believe that what was given to us against diphtheria was the beginning of the end of the dangers of parasitic disease? Let us avoid this mistake in future, if we can. When anti-streptococcal serum was introduced, many believed that it would do for scarlet fever what diphtheria antitoxin did for diphtheria ; but surely such hope was illogical. For pure toxaemic diseases, such as diphtheria and tetanus, an antitoxin may be expected to be curative, if given early, but against a parasite which invades the tissues no such action can be expected ; for although we hear much of biological agents alleged to have anti-bacterial powers, their use in the field, if it does not discourage us, tells us that we are still a long way from the possession of such remedies. Active immunization is not very promising, owing to the local character of streptococcal immunity ; but something may come of it, for if it is the invading property of the streptococcus which makes it so grave a menace, it is its toxins which kill, and immunity to these toxins is within hope.

The body possesses great powers to rid itself of streptococci which invade it. Recovery from septicaemia is not rare, and one form of post-scarlatinal haematuria in which masses of streptococci are discharged by the kidney without setting up disease in that situation is suggestive of great powers of riddance. Attempts to kill streptococci in the tissues, or in the blood, by chemical agents are not very hopeful. The most promising were the arsenical compounds, but the damage these do to the leucocytes overbalances any direct lethal action they have on the cocci ; so they have fallen from favour. Personally I believe that these and similar remedies have no future, but I hope I am mistaken.

Prophylaxis

About the prevention of streptococcal implantation little can be said which is not common knowledge. The prevention of scarlet fever by isolation of the sufferers is the most magnificent failure of preventive medicine, but the isolation of the non-infected has been an equally magnificent success, for this is nothing but Listerian surgery carried to its logical conclusion. The surgeon sometimes fails, not through his fault or that of his dressers or nurses, but from the peculiar character of his enemy, which can lie dormant in places immune to its action, but from which places it wanders to new sites which are damaged and cannot resist its attentions.

The removal of septic foci seems a logical remedy for this danger, but doubts have arisen of its soundness and there are probably better ways to be discovered of overcoming this persistent menace to all of us. That we shall ever prevent pathogenic streptococcus from living parasitically upon us is, I think, unlikely, but that we shall discover means of rendering this biological union harmless can be looked for with some confidence. The key to it will probably be found in the study of scarlet fever.

Before I close, I would make two remarks to stimulate the bacteriologists present to take part in the discussion. The question of the type of the streptococcus is of profound importance, but there seems to be much difficulty in its determination. Formerly, when desiring the opinion of a bacteriologist upon types of streptococcus, I sent cultures on similar media taken at the same time, in similar conditions, to four bacteriologists of unimpeachable veracity. No two reports were ever in complete agreement.

I mentioned a belief that the passage of a streptococcus through a host exalted its virulence for similar hosts. I instanced the progress of epidemic puerperal fever. The fact—for I have been told that it is a fact—that these streptococci alleged to be exalted in virulence for puerperal women do not show exaltation of virulence for male guinea-pigs has nothing to do with the case.

TRAUMATIC OEDEMA

A PITFALL IN PHYSICAL MEDICINE

BY

L. C. HILL, M.D., M.R.C.P.

HONORARY PHYSICIAN TO THE DEVONSHIRE ROYAL HOSPITAL, BUXTON

Physiotherapy, largely on account of its unique flexibility of application, has at last received tardy recognition, and now takes its place as an important branch of medical treatment. There are, however, certain disease processes which at first sight would appear of the type likely to benefit from such methods but which fail to respond as expected. I have recently encountered in hospital and private practice such a group, and after floundering in a state of considerable uncertainty for some time I arrived at certain conclusions regarding their appropriate treatment as a result of the experience thus obtained.

To those whose work brings them into regular contact with industrial compensation cases the development of oedema after injury to an extremity offers great difficulty, and it is important that the peculiar problems of true traumatic oedema in regard to its treatment, expected course, and prognosis should be fully understood. My main object has been to discuss the various methods of treatment and their influence upon the development and prognosis of the disease. A summary of present knowledge of the aetiology and pathology has also been included, and an attempt has been made to review the various theories of causation in the light of such knowledge. The following cases will serve as illustrations.

Case I

A quarryman, aged 32, on April 16th, 1934, sustained a severe crushing injury to the left foot from a fall of stone. There was moderate shock, bruising of the lumbo-sacral region, pulping of the great toe with protrusion of bone, and there were two fractures of the terminal phalanx.

For seven weeks before admission the foot was immobilized in splints, but the patient was allowed to sit up for short periods daily after the third day. The oedema diminished but did not disappear. After a further fifteen weeks on crutches the oedema gradually increased and pain became severe.

He was seen in the out-patient department of this hospital on October 3rd, five months after the original injury. The limb was grossly oedematous almost to the knee, and the skin was cyanosed, glossy, and tender to pressure; he was unable to put his foot to the ground.

X-ray findings: "Patchy areas of osteoporosis contrast with intense sclerosis, particularly in the metatarsal heads."

TREATMENT

He was treated for one month with local whirlpool baths, alone and with massage, contrast baths, and underwater douches. The pain was intensified after each treatment, especially after massage, and the oedema increased until the patient was unwilling to submit to further treatment along these lines. On November 3rd the limb was immobilized in plaster-of-Paris from toe to knee for one month. The patient was advised to rest with the limb elevated.

On November 30th, when the plaster was removed, the oedema had diminished considerably and there was no pain. The *x*-ray report was: "Decalcification proceeding; areas of porosis now predominating; sclerosis disappearing." Massage was instituted and was followed by the immediate return of pain and oedema. After three days plaster was reapplied for three weeks. On December 22nd the plaster was removed again, the oedema and pain being greatly improved; elastoplast was substituted and rest and elevation advised, but the patient was permitted to move about the house. The *x*-ray report was: "Decalcification now excessive; mottled appearance still evident."

Very slow progress was maintained for the next twelve months. With the object of speeding up recovery he was referred for operation, but the surgeon considered progress satisfactory under the conservative treatment and operation therefore unjustifiable. All attempts to hasten progress by physiotherapy invariably ended in failure and temporary relapse, the patient finally refusing further experiments in this direction.

The foot is now shrunken, mobility is reduced at all joints, and there is severe pain on attempting to increase forcibly the range of movement. The skin is still cyanosed and cold. He complains, too, that the pain is worse in cold weather. Several efforts to find him a light job have ended in failure. Deterioration in his morale is now obvious, the unfortunate result of prolonged absence from regular work and the limitations imposed by living in a small village.

The report on an *x*-ray taken in October, 1935, is: "General decalcification, mottled appearance disappearing; some increase of density in the shadow cast by peri-articular soft structures."

Case II

The lady superintendent of a rest home, aged 58, on July 29th, 1934, sustained a Colles fracture of the left wrist from a fall while climbing; there was little shock but much deformity. The wrist was immediately immersed in cold water for half an hour. It was then reduced without anaesthesia, and splints were applied. The position was modified the next day under gas. *X*-ray showed the fragments in satisfactory alignment after the second reduction. Thereafter she resumed her normal duties with the wrist in splints and a sling. After a week daily passive movements were started with massage. The swelling, after diminishing during the first week, rapidly increased and the pain became worse.

Treatment along these lines continued for two months at a large hospital centre.

When she was first seen at this hospital, on October 1st, the hand and forearm were grossly swollen, brawny, and tender, especially over the lower end of the radius and at the phalangeal joints. The skin was cold, cyanosed, and glossy, and symptoms of aching pain, numbness, and uselessness were complained of. The *x*-ray report was: "Fracture united. Patchy decalcification in tarsal and metatarsal bones with, apparently, areas of sclerosis." Later, on October 29th, after one month's physiotherapy: "Mottled appearance more evident. Loss of definition in joint."

TREATMENT

Physiotherapy was tried for one month, local whirlpool baths, massage, underwater douches, contrast baths, and hot paraffin baths being given; the oedema and pain increased. On November 30th the wrist was immobilized in plaster from fingers to elbow, with elevation for one month. It was then removed, and pain, swelling, and tenderness were diminished. Passive movements and massage for one week produced immediate relapse. A plaster allowing movements of the fingers was then reapplied for three weeks. The next *x*-ray report was on December 9th: "Decalcification predominating; sclerosis disappearing."

On December 22nd her condition was generally improved. A light plaster cock-up splint, suitable for removal daily for short periods, was then applied.

Further progress has been slow. The fingers at the end of two months were semi-flexed and stiff, with phalangeal joints enlarged. Pain followed efforts to straighten them forcibly. An increase in swelling followed moderate use and the application of heat, while the pain was aggravated by cold.

Case III

A shop assistant, aged 18, sustained a severe sprain of the right wrist from a fall on to the back of his hand on October 8th, 1934.

The discomfort and slight swelling gradually increased. The wrist was up in splints and a sling at the end of one week. When seen in the out-patient department of this hospital on October 29th the hand and wrist showed the typical appearance of traumatic oedema. *X*-ray showed commencing loss of calcium from metatarsal heads.

TREATMENT

Physiotherapy, instituted for one month, caused an exacerbation of symptoms and a spread of oedema into the forearm. On November 28th the arm, from fingers to elbow, was immobilized in plaster for three weeks; but he was given no precise instructions as to elevation. *X*-ray of the hand then showed decalcification extreme in patches, contrasting with areas of sclerosis—typical mottled appearance; and of the neck, supernumerary cervical rib on right side. On removal of the plaster the pain was less, but the oedema was only slightly diminished. The plaster was then reapplied for four weeks, with elevation; at the end of this time there was no pain, and the oedema had greatly diminished. He was discharged on December 22nd with a cock-up splint and a sling. The *x*-ray report on January 22nd was "Decalcification predominates." At the end of one year the hand was said to become puffy after a day's non-laborious work, while movements were weak and sluggish. Pain was present only after prolonged use. An interesting feature in this case is the presence of the cervical rib on the affected side, and its possible effect upon the control exercised by the higher sympathetic centres, particularly in view of the relative slightness of the original trauma.

Case IV

A stone filler, aged 43, sustained a fracture of the tibia and fibula from a fall of stone on May 20th, 1935. There was a moderate degree of shock, with extensive bruising over the back of the thigh. The limb was immobilized in plaster for six weeks. On removal, union was satisfactory and there was only a trace of swelling present. He was then treated by physiotherapy, with active and passive movements, for seven weeks. There was a progressive increase in oedema and pain. On August 22nd, when I first saw him, typical traumatic oedema was present, and an *x*-ray showed: "Healed longitudinal fractures of tibia and fibula four to six inches above ankle; fragments in good position. Bones of foot show typical mottled moth-eaten appearance. The osteoporosis predominates."

Immobilization was advised but not carried out; rest with the leg elevated and firm bandaging was tried, off and on, for the next two months; afterwards he was allowed to walk.

Recent progress has been slow. The leg is still swollen, particularly at the end of the day or after walking. The skin is slightly cyanosed and cold. He has been unable to resume work yet, but is clearly improving. The two most recent *x*-ray reports were: January 28th, 1936—"Generalized osteoporosis of bones of foot and lower end of the tibia and fibula; no mottling, but 'lines of force' prominent"; and on March 29th—"Moderate recalcification has occurred in last two months, 'lines of force' not so clear."

There are three main theories with regard to the production of traumatic oedema according as the condition is thought to result from changes in the circulatory, lymphatic, or sympathetic nervous systems. Whatever the cause of the retention of fluid in the tissues the distension produced may ultimately lead to a proliferative reaction in the connective tissues and result in diffuse fibrosis, which shows itself mainly as a permanent periarticular thickening with a consequent hampering effect on movement.

The Circulatory Theory

Venous stasis, which is an accepted cause of oedema, may result from the blocking of a vein, as in phlebitis, vaso-dilation, or vaso-constriction. By means of local thermometry, Braeucker showed that the circulatory disturbance is localized in the region of the arteriolo-capillary network, manifesting itself by wide and frequent alterations in the skin temperature. Unfortunately, pathological examinations have not assisted in establishing the culpability of the circulatory system, since organic changes in the vascular walls have only been found in a fraction of the cases investigated. There is much evidence to show that traumatic oedema cannot be due to circulatory effects alone, and it may be summarized as follows:

1. Leriche showed in a case of oedema that section of a venous cord blocked by phlebitis, which could not therefore influence the circulation, caused disappearance of the oedema. (The effect of this operation is that of a true sympathectomy.)

2. Methods aimed at improving the circulation by direct action upon the vessels are useless.

3. Ranvier tied the inferior vena cava of a dog below the level of the right ventricle and then cut the sciatic nerve. As a result gross oedema developed on the affected side. When the sciatic nerve was cut below the point where its fibres enter the vessel wall there was no oedema.

4. Leriche, in ten instances, tied three veins in a rabbit's ear without producing oedema. If, however, a cervical sympathectomy were done at the same time, oedema resulted.

The Lymphatic Theory

The theory that lymphostasis is to blame in traumatic oedema is supported by Basset, Hagenau, and Gemthrou, who came to this conclusion after failing to obtain satisfactory results by operative measures. These operative measures included:

1. Exposure of the iliac vessels for the purpose of confirming or not the presence of the thickened bands which had been discovered by Leriche. In no case were any such bands discovered.

2. Peri-iliac sympathectomy: at this operation fragments of adipose subcutaneous tissue were removed, and while on histological examination they were found to be rich in arteries and nerves the only marked abnormality was the presence of abnormally dilated lymphatic canals.

The writers suggest that under the name of traumatic oedema are grouped several different conditions, some nervous in origin (meningeal thickening, spina bifida of Leri), some venous, some perivenous (Leriche), and some undoubtedly lymphatic in origin. Various explanations have been put forward in regard to the lymphatic theory. Some workers consider that it may be due to changes in the nerve supply of the lymphatics and others to an obliterating lesion analogous to filarial elephantiasis. As for the site of the lesion, the lymphatic dilatation points to the probability of an obstruction above that area in the pelvis which was explored at the time of the operation.

According to Adami, mere obstruction of main lymphatic channels does not lead to a complete stagnation of lymph, as there is a continuous interchange with the capillaries. Nevertheless continuous and prolonged distension of the parts with lymph may lead to a fibrosis, diffuse in type, although it is only obvious around the joints. Evidence of this is shown at an early stage by the appearance of connective tissue changes of a subinflammatory nature. Clinically, a dependent limb has increased arterio-capillary pressure, whereas the same limb distended with oedema has relatively a smaller amount of blood in it. The connective tissue changes may be due to a combination of indirect tissue reactions (from increased normal or abnormal lymph) and chronic venous congestion.

The Sympathetic Nervous Theory

Leriche may be truly described as the greatest exponent of this theory, and his published figures are very striking; Telford and Stopford in this country and others have also worked on this problem. Brandao describes a series of operations on the upper limb which produced exactly similar results. He began with a sympathectomy, the immediate result of which was disappearance of oedema and pain, but at the end of ten days the condition reasserted itself. The next step was the removal of the stellate ganglion. Again the relief was immediate, this time lasting for three months, after which the swelling returned, but to a diminished extent, and it did not extend above the wrist. Lastly, he removed the whole of the cervical sympathetic system, with the result that the oedema once again disappeared and had not returned in any of his patients at the time of publication of the article, a period varying between one and a half and two and a half years after the operation.

Leriche, on the other hand, carries out the operation in exactly the reverse order, taking out the ganglion first and afterwards carrying out the sympathectomy, with equally good results in the cases described. The apparently segmentary control of the sympathetic nervous system was shown by the fact that after a sympathectomy the oedema returned to the same extent as before operation, whereas after the stellate ganglion had been removed it only returned to a diminished extent. It would thus appear that ultimate control depends upon the preservation of the whole cervical chain. It is curious that when Leriche and Jury removed the superficial stellate ganglion in a rabbit oedema appeared, while in the case of a rabbit with oedema from other causes the removal of the same ganglion caused the oedema to disappear.

Calvé maintains that oedema is always an accentuation of a physiological state; in other words, it is probably due to a disturbance of the mechanism regulating normal physiological balance. The operative measures described above act by suppressing the long reflex. The control of fluid interchange in the extremities depends upon the activity of local peripheral centres operating through short reflexes. These are sufficient to maintain equilibrium in the absence of abnormal stimulation via the long reflexes from the higher sympathetic centres. Thus it has been shown experimentally by Leriche and Fontaine that local oedema due to phlebitis can be cured by sympathectomy or removal of the appropriate sympathetic ganglion, thus indicating the capacity of the local centre to restore fluid balance after the removal of an abnormal higher influence.

The condition appears to be relatively unknown in children, and the several theories advanced to explain this include the following: the increased vascularity of the growing child; the extreme rapidity with which their lymph circulation is re-established; and the relative unimportance of the long reflexes in the control of local fluid interchange in the extremities.

Symptoms and Signs

This aspect of traumatic oedema has been sufficiently covered in the description of the cases, so that a short summary will suffice.

The initial trauma is usually severe, but not necessarily. Three of the present series were associated with fractures and gross injury; the fourth followed after a sprain of the wrist. Pain is always present. It diminishes in severity in proportion as the tissues recover from the effects of the original injury. It reappears when immobilization ceases, and is intensified by the application of any form of physical treatment. It is variously described as being of a jarring, aching character, and deep-seated. Tenderness to deep pressure is a constant feature. In the later stages the pain becomes intermittent, but it always accompanies movement. It is probably due to changes in the spatial relationships of the sensory nerve endings, which are pressed upon by the increasing fluid bulk, especially in the extremes of movement.

The primary swelling is soft, pits on pressure, and tends to diminish rapidly with the preliminary measures of rest, especially in plaster. The skin shows little abnormal change; it varies in colour but is usually pale; it may be moist and its temperature is normal. Trophic changes are not present in the nails. The secondary swelling or true traumatic oedema appears at the end of two or three weeks, and is hard and brawny in character. The skin is now usually cyanosed, cold to the touch, and possesses the glossy appearance associated with trophic changes. The nails become grooved and brittle. Other sensory variations occur with hypo-aesthesia or more often hyperaesthesia. The persistent and unchanging character of the oedema soon becomes apparent, and is characteristic. In the hand the appearance of the swollen, tapering fingers with prominent joints is typical. Connective tissue changes begin soon after the establishment of the secondary oedema, and in some cases ultimately progress to a generalized diffuse fibrosis which is obvious only when the oedema has subsided. It then appears mainly as an enlargement of the joints, and is responsible for the deformity and loss of function. It is said to occur more particularly in joints distal to the site of the trauma.

Some loss of function is always present. Each joint possesses a greatly reduced range of painless movement, beyond which pain occurs. The loss of movement is not due to joint changes or to tendon fixation, but to the hampering effect of tender peri-articular thickening.

X-Ray Changes

Progressive decalcification with, in the late stages, increased density of the peri-articular soft structures constitutes the main change. The decalcification is more intense than that which follows simple disuse. The loss of calcium is uneven, and the bones show a curiously mottled, moth-eaten appearance. This mottling is particularly evident where physiotherapy has been persistently employed or where mobilization has been prematurely allowed. In such cases areas of dense sclerosis appear side by side with the more typical porosis. It is interesting to reflect that such changes do not follow the oedema of general anasarca, nor that due to the ligation of veins or the severance of nerves in a limb, excluding trophic disturbances. The slight increase in the density and thickness of the peri-articular shadows is only seen in the late stages of neglected cases.

Physiotherapy and Mobilization

With regard to the value of physiotherapy in the treatment of traumatic oedema the opinions of other workers are in close accord with my own experience. Generally speaking, at all stages of the disease it is likely to do more harm than good. Occasionally in the later stages, when the morale of the patient has been undermined by the prolonged period of incapacity, physiotherapy may act as a stimulant and so have a useful psychological value. In particular, massage, passive movements, douches, and baths are dangerous, and if persisted in will bring about an increase not only in the oedema but also in the subjective discomfort of the unfortunate patient. A certain amount of active movement of fingers or toes may be permitted even in the early stages (this is quite consistent with immobilization in plaster), and in the later stages, when not associated with pain, active movements may lead up to the provision of suitable light work. Early mobilization of fractures and severe sprains is responsible for the development of traumatic oedema in the majority of patients.

Immobilization

This is the method of choice, and it must be early, complete, and accompanied by elevation of the limb. It is not within the province of this article to deal at length with the treatment of fractures by immobilization in plaster with provision, consistent with complete immobilization at the site of the fracture, for finger or toe movements, and permission even for gentle use of the limb ; such treatment would prevent many cases of traumatic oedema. When, in spite of these precautions, oedema appears or fails to disappear, then complete immobilization of the whole limb with elevation is essential for at least one month. At the end of this time the plaster may be " bi-valved " and, if the oedema is diminishing and the pain has disappeared, removed for a few minutes daily for gentle active movements. These may be carried out with great advantage in a bath at about 99° F. At least a fortnight should elapse before greater activity is permitted. Afterwards the length of time for which the plaster is removed may be progressively increased.

Operative Measures

Should the oedema return quickly then two courses are open: either a repetition of the immobilization or recourse to operation. The choice of operation lies between peri-arterial sympathectomy and the removal or suppression of the appropriate sympathetic ganglia. Having had no experience of these methods I am not in a position to discuss the relative merits of each or of their combination. The advantages of early recourse to surgery are the very material shortening in the period of recovery and the prevention of the ultimate loss of mobility and the peri-articular fibrosis which inevitably occurs in proportion to the length of time during which the oedema has been present and its extent.

Discussion

Sufficient space has already been accorded to a consideration of the relative parts played by the circulatory, lymphatic, and sympathetic nervous systems in the production of traumatic oedema. All are involved, the breakdown of the normal mechanism of fluid interchange being, whatever the cause, maintained by abnormal impulses from the higher sympathetic centres via the long reflexes ; and these in their turn depend on irritating afferent stimuli from the damaged tissues, now distended with lymph. The intense bony atrophy may be due to a state of chronic venous congestion, the obstruction to the venous return following extreme distension of the part with lymph. The operation of sympathectomy, which by dilating the vessels might be expected to aggravate the situation, actually produces its beneficial effect by suppressing the long reflexes from the higher sympathetic centres.

It is a little difficult to reconcile the good results from two such vastly different procedures as immobilization and sympathectomy. It is probable that immobilization, combined with elevation, by relieving tension and promoting complete muscular and ligamentary relaxation, may modify the afferent impulses to the sympathetic ganglia. Thus a gradual toning down of the abnormal efferent influences responsible for the maintenance of the oedema takes place. The successful performance of a sympathectomy probably effects its cure by a similar action.

Conclusions

1. Traumatic oedema is a specific affection of an extremity coming on several days after trauma, which is usually, but not always, of a severe character. It consists of a distension of the part with lymph following a dislocation of the normal fluid interchange in the tissues. Experimental evidence and a consensus of opinion suggests that changes in the lymphatic rather than the circulatory systems are responsible. Its persistence is due to the development of abnormal influences from the higher sympathetic centres which prevent the re-establishment locally of the normal equilibrium.

2. The majority of cases can be prevented by the correct treatment of fractures as described elsewhere, and by the avoidance of early mobilization.

3. In an established case early immobilization with elevation and complete rest will not only greatly curtail the period of incapacity but will prevent the resultant fibrosis.

4. The application of physiotherapy at any period other than in the very late stages is unjustifiable.

5. Operation in certain hands offers great advantages when the condition is established, since it not only cuts short an otherwise protracted course, but if carried out at an early stage prevents the development of fibrosis. It would appear that both peri-arterial sympathectomy and removal of the corresponding portion of the higher sympathetic system is required for a permanent cure.

6. Uneven osteoporosis is the characteristic *x*-ray appearance with, in the later stages, peri-articular thickening.

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Clinical Memoranda

Dysphagia Due to Neck Retraction in Cerebro-spinal Fever

A Method of Treatment

Neck retraction in cerebro-spinal fever sufficient to cause difficulty in swallowing is exceedingly rare, but when it does occur it is a matter of much distress and anxiety to the patient if conscious, and a method of alleviation of this condition is interesting enough to warrant recording.

I have recently discharged from this hospital a young man of 20 years, who was admitted with cerebro-spinal fever on the sixth day of disease with such marked head retraction that there was complete obstruction to swallowing, even of fluids. He was fed with an oesophageal tube on the first and second days after admission, but the mechanical obstruction progressed and the tube could not be passed. His general physical condition, however, was fairly satisfactory, and was improving with serum therapy, but he was very distressed that he was unable to swallow. Following the injection of 2 c.cm. of 2 per cent. novocain into the muscles in the suboccipital region, the neck rigidity was greatly reduced almost immediately, and the patient was able to swallow normally. He made an uninterrupted convalescence, and had no difficulty in swallowing after the novocain injection.

G. EMRYS HARRIES, M.B., B.S.(Lond.), D.P.H.
Canton, Cardiff. Medical Superintendent, Cardiff City Isolation Hospital; Lecturer in Infectious Diseases, University of Wales.

The Blood Thirty-five Years after Splenectomy

Mrs. X., aged 71, had a wandering spleen removed in May, 1900, at the Chelsea Hospital for Women. She first came under my care in 1929, and since then I have often examined her blood. Always she was anaemic, and the arresting feature of the film was the number of Jolly bodies—anisocytosis was only moderate and polychromasia not more than in many minor anaemias.

As typical we may take the findings for July 27th, 1934: haemoglobin, 80 per cent.; colour index, 0.9; red cells, 4,400,000. Leucocytes, 10,000, as follows: mast 1, eosinophils, 5; neutrophils, 43; lymphocytes, 44; monocytes, 6; plasma 1 per cent. In spite of absolute neutropenia there was leucocytosis, as the lymphoid cells were more than doubled. In counting 100 white cells there were seen 87 Jolly bodies, 8 Cabot rings, 13 punctate cells, and 25 polychromes. One disk showed all four conditions, and several of the Jolly bodies, Cabot rings, and punctate cells were also polychrome.

To explain the persistent anaemia and pathological regeneration we must consider these facts:

1. In newborn kittens films show anisocytosis, polychromasia, Jolly bodies, and erythroblasts, but the last disappear in a few days. The other three persist throughout life in the cat, though Jolly bodies are less numerous than in kittens.

2. In newborn babies films show the same, but Jolly bodies and erythoblasts are not so numerous as in kittens, and in the child both disappear in a few days. Anisocytosis and polychromasia remain throughout childhood, and so does a tendency to anaemia.

3. In man, after moderate haemorrhage, anisocytosis and polychromasia appear, and after severe haemorrhage Jolly bodies and erythroblasts also. The inference is that the first two indicate brisk normal regeneration, and that Jolly bodies and erythroblasts mark the onset of abnormally active erythrogenesis.

4. At a varying time (usually months) after splenectomy films show anisocytosis, polychromasia, and Jolly bodies but not erythoblasts, and at this point erythrogenesis often reaches equilibrium and persists throughout life, as in the cat. Nevertheless, in man the inference is that the first line of defence against anaemia has gone, and that there is a continuous demand for brisk normal regeneration; while the number of Jolly bodies suggests that this approaches the need for abnormally active erythrogenesis. In our patient this was confirmed by the presence of punctate basophilia and Cabot rings, which mark the beginning of definitely pathological regeneration. Now this is just the blood picture found early in plumbism, in which emphasis is laid on punctate basophilia (cytoplasm) rather than on Jolly body (nucleus); whereas in cats, whose cytoplasm resists such change, therapeutic doses of lead determine tenfold increase of its Jolly bodies with appearance of Cabot rings and erythroblasts.

West Ealing. ROBERT CRAIK.

Painless Labour

In these days, when perhaps the perils and dangers of childbirth are somewhat unduly ventilated in the popular press, the following case may merit a brief note.

CASE REPORT

The patient was a domestic servant, aged 18, and a primipara. She was of short slight build, active-looking, and intelligent. On the morning in question she got up at 6.30 o'clock and did her usual somewhat laborious general domestic work. She finished assisting her mistress with bedmaking at about 11.15 a.m. At 11.20 a.m. she was seen by the latter running up the garden path in the direction of a rather primitive earth closet. Ten minutes later she reappeared with a bundle wrapped in a newspaper. This she presented to her mistress, with the naive and nonchalant remark, "Look what I've got"! To the latter's great surprise the bundle contained a very cold, indignant, and protesting infant.

While the mistress was wrapping up the infant in warm flannels the girl again ran off to the scene of her recent trial, to "clean up the mess" (as she subsequently termed it). This self-appointed task concluded, she returned to the house, picked up the infant, and cheerfully proceeded to walk to her home, about a quarter of a mile distant up the steep hillside. This necessitated crossing several fields and three stiles. At 1 p.m. she was seen by the district nurse. The placenta was still in the vagina, and was easily expressed by the nurse with membranes intact. The patient's own statement, her excellent general condition, and the firmly contracted uterus showed that there had been but a normal loss of blood.

The infant was a lusty 7-lb. female child, liberally smeared with faeces. The cord was about twelve inches long, with a ragged tear where it had given way with the strain of the child's descent to its strange resting-place. I saw the patient at 4 p.m., when her pulse and temperature were normal and the uterus was firmly contracted. There was a small perineal tear, which needed one suture. The mother herself looked rosy and well, and was most indignant at having to be kept in bed, as she "felt ready for a day's work." In answer to my questions she admitted feeling a little abdominal discomfort the previous evening. This she attributed to some sour buttermilk she had taken. In any case it was not severe enough to interfere with her night's rest. She was insistent that she had no pain whatever the following morning—only a sudden urgent need to have her bowels moved. While at stool she "felt something coming away," and heard the cry of the infant, which she subsequently rescued from its unusual couch. The puerperium was thoroughly uneventful and normal in every respect, with no rise of the maternal pulse or temperature.

COMMENTARY

This case appears somewhat unusual because of: (*a*) the complete absence of labour pains; (*b*) no evidence of maternal fatigue or shock; (*c*) normal loss of blood, considering the highly unorthodox conduct of the third stage of labour; and (*d*) the survival of the infant despite the vicissitudes of its birth, etc.

Denbigh. T. B. PRYS-JONES, M.R.C.S., L.R.C.P.

Reviews

CLINICAL CARDIOLOGY

Clinical Heart Disease,[1] by Dr. S. A. LEVINE, is an interesting book. The matter is largely drawn from the author's experience, and he freely states his own point of view and ideas. The book does not follow any special plan. The subjects are chosen and dealt with independently, in view of their practical importance. In fact, practical considerations have first place all through this work. The aim seems to be to simplify all matters, especially that of diagnosis, as much as possible. Rheumatic heart disease and the valvular lesions developing from it occupy two chapters. In the first of these the general clinical features of the disease are very well set out in all their protean manifestations. Dr. Levine lays considerable stress on the constitutional factor. He thinks that tonsillectomy renders children slightly less liable to attack. Diseases of the aortic and tricuspid valves receive a chapter. In discussing pericarditis he holds that some forms cause very gross hypertrophy. The difficulties in diagnosis are made clear: Pick's syndrome is defined. Angina pectoris and coronary thrombosis are dealt with together.

There are some interesting views as to the origin of hypertension, one being that the abnormality may have its origin reflexly in the heart. "Malignant hypertension" is left somewhat obscure. There are some interesting observations in the chapter on thyroid heart disease, particularly with reference to latent cases. The chapter on congenital heart disease gives short and clear accounts of the various types. Functional heart disease is a sensible practical chapter. Further on the interpretation of systolic murmurs brings in much useful information. The pathogenesis of cardiac dyspnoea is rather disappointing in its treatment; modern work hardly receives full share. The chapter on treatment of congestive failure rather lacks detail, but is very practical. The problem of pregnancy and heart disease is one of the best in the book. The subject could hardly have been handled better. The last chapter deals with electrocardiograms. The illustrations are complete and good.

The book may be read with profit. Here and there the style jars on English ears, and there are some obscure passages where the expression might be improved.

THEORY OF ARTHRITIS DEFORMANS

Professor KONRAD STAUNIG'S *Theory of Arthritis Deformans*[2] is a physical-chemical one. Roughly speaking, he endeavours to explain all the phenomena of the disease and the local changes which occur in the bony, cartilaginous, and soft parts in and about the joints by alterations in concentration and in elasticity of shape and volume. To illustrate his meaning he refers to various more or less familiar phenomena, such as the spontaneous separation of a jelly-like coagulum into a denser core and a liquid material; the hardening of sealing-wax, accompanied by loss of elasticity and increased liability to fracture; the phenomena of colloid chemistry and precipitation from solutions (in regard to calcareous deposits); and so on. He points out the part played by tension of tendons and ligaments in the formation of bony "spurs" and outgrowths, and that played by loss of elasticity and hardening in the attrition of articular surfaces. He shows why, for instance, the shoulder should be specially liable to peri-arthritic concretions. Dr. Staunig, who is a radiologist at Innsbruck, has introduced suitable figures from radiographs to explain many of the pathological changes mentioned in his text. Nevertheless, in spite of its clear language, the booklet requires careful reading if the author's theory is to be fully understood.

THE C.S.F. AND THE BLOOD

The chemistry of the cerebro-spinal fluid was thoroughly studied by Mestrezat before modern biochemical technique had made it possible to study the chemistry of the blood in its relation to disease. In *The Cerebro-spinal Fluid and its Relation to the Blood*,[3] Dr. KATZENELBOGEN has succeeded in giving a comprehensive and critical review of the large amount of work that has been done since that time on the interrelation of these two fluids, and has attempted to formulate the actual state of our present knowledge on the subject. Although the tentative conclusions he has reached will not always prove acceptable to others who have worked on the subject, the full and impartial manner in which he has marshalled the known facts cannot fail to commend itself to them.

The book is written by a biochemist, and therefore deals chiefly with questions of chemistry, although in the early chapters the author surveys the formation and circulation of the cerebro-spinal fluid from a more physical point of view. But even here his preoccupation with chemical problems is evident, and there is little discussion of the relation of cerebro-spinal fluid pressure to blood pressure. The chief problem dealt with is the mode of action of the choroid plexus. Regarded by Faivre, and for more than half a century after him, as a secreting gland, its action was considered by Mestrezat in 1912 to be little more than that of a dialysing membrane. Biochemists at once acclaimed this new point of view, which both offered a simple explanation for many of the changes found in the cerebro-spinal fluid in disease and suggested that by studying the work of the choroid plexus they might test the Donman membrane theory in its relation to vital phenomena. But recently some doubt has arisen as to whether all the known facts could be explained on the theory of dialysis. For example, biochemists, both in England and on the Continent, have found themselves unable to explain on this basis the fact that the percentage of potassium is normally lower and that of magnesium normally higher in cerebro-spinal fluid than in the blood or in an ultra-filtrate of blood plasma.

Considerable space is devoted to Walter's "bromide permeability" test, which the author has studied in a large series of patients. He concludes that although the test provides a satisfactory method of studying the barrier between blood and cerebro-spinal fluid, it has little value either in diagnosis or in prognosis. From a more practical point of view the nature of the barrier between blood and cerebro-spinal fluid or brain tissue may determine the effect of drugs on the central nervous system or may explain the action or lack of action of endogenous toxins on the brain. On both these questions much work has been done, and although few definite conclusions have so far been reached, enough data are available to guide the clinician both in formulating theories and in treating patients. These data are collected in the later chapters of the book, which deal with the factors influencing the barrier between blood and brain or cerebro-spinal fluid, and with the penetration of such drugs as arsenic and bismuth into the nervous tissues.

A bibliography, over forty pages in length, adds greatly to the value of the book.

[1] *Clinical Heart Disease*. By Samuel A. Levine, M.D., F.A.C.P. Philadelphia and London: W. B. Saunders Company. 1936. (Pp. 445; 97 figures. 24s. net.)

[2] *Theorie der Arthritis Deformans*. By Professor Dr. Konrad Staunig. Dresden and Leipzig: Verlag von Theodor Steinkopff. (Pp. 44; 22 figures. RM.3.)

[3] *The Cerebro-spinal Fluid and its Relation to the Blood. A Physiological and Clinical Study*. By Solomon Katzenelbogen, M.D. Baltimore: Johns Hopkins Press. London: H. Milford, Oxford University Press. (Pp. 468. 22s. 6d. net.)

ENDEMIC CRETINISM

The house of J. Springer, Berlin, notable for its scientific publications, issues the seventh volume of a series of monographs on topics of special interest to clinicians and pathologists. This volume[4] by DE QUERVAIN, surgeon in Berlin, and WEGELIN, pathologist to the Berne University, deals exclusively with the various aspects of endemic cretinism, a condition confined to limited areas in very varied countries. A survey of these countries shows centres of cretinism in Europe (Alpine countries), Asia, and America, especially South America. Little is known about cretinism in Africa. Australia is reported to be free from it altogether. England, although it has a centre of endemic goitre around Derby, is almost entirely free from cretinism. This condition is confined to countries with a severe goitre morbidity. The connexion between goitre and cretinism, long disputed, must now be regarded as proven. The complete lack of thyrotropic function—which begins even in the ante-natal stage of development, and continues right through the early childhood of the patient, who in those early years is hardly ever classified as a cretin—damages the patient's brain and its development to such an extent that even the best substitution-therapy when it is started later on in life can never restore normal health, nor hope to produce a normal individual. Improvement of some of the organic systems takes place, but the stress of dealing with the condition must be laid on prophylactic measures rather than therapy. This little book is a valuable compendium of the latest views on a difficult subject. A carefully compiled bibliography is given at the end.

ADOLF LORENZ

Professor LORENZ,[5] who is well known in connexion with his operation for congenital dislocation of the hip, has had a varied and interesting life. Born in 1854 at a small country town in Silesia he came of peasant stock on both sides. His father was a harness-maker who kept a little inn where the customers could refresh themselves whilst they waited until the repairs were finished. Poor as they were his mother's brothers did well: the elder became a doctor, the younger entered the Church and, as Father Gregor, was capitular or abbot of the Benedictine Monastery of St. Paul in Carinthia. Adolf Lorenz, afterwards Hofrat and Professor, on his own showing ran wild for several years as an ordinary village urchin, often hungry, sometimes beaten, as he well deserved to be, and always without shoes, stockings, or decent clothes. Nevertheless he persisted in saying that he was going to be a great gentleman when he grew up, and a great gentleman he became. Having a good voice his uncle took him into the monastery as a choir-boy and would have made him a monk. Adolf preferred medicine, and with the aid of a scholarship obtained his degree, taught anatomy, and became assistant to Edward Albert, the distinguished surgeon in Vienna, who with Billroth helped to make the reputation of the school. It was during the spray period, and Lorenz's skin was so tender that he had to grow a beard because he could not shave, whilst his hands became so inflamed as to make it impossible for him to continue operating. With reluctance he abandoned surgery, and casting about for some other avenue of work discovered that, at any rate in Vienna, orthopaedic surgery was virgin soil. He cultivated it diligently and soon made a European reputation. The result was a fortune which he invested in Austrian securities ; then came the war, and he was soon nearly as poor in late middle life as he had been when he was born. Yet he remained a great gentleman, and aided by an equally great-minded wife bated not heart nor hope but steered right onwards and migrated to New York, where he is now living in his eightieth year. The story is well told, sometimes perhaps a little indiscreetly, but without rancour or bitterness, either personal or political. It is hard to have been born an Austrian, to have been made into a Czechoslovakian, and probably to die an American citizen when one's heart and soul remain all the time in Vienna. For the rest the book is well worth reading as the record of a simple well-spent life full of vicissitudes. The story deals throughout with the man rather than with the surgeon. It is as good as a novel, and has the advantage of being true. For Professor Lorenz every woman is divinely beautiful, yet Frau Lorenz never had occasion to be uneasy, and has guided him along the strict path of virtue, truth, and common sense, for she, like her husband, is an optimist and has a sense of humour. The book is well printed and well illustrated, but neither the Greek nor the Latin spelling is impeccable.

THE TWO OLDEST PROFESSIONS

Dr. TAGE KEMP'S work on *Prostitution*[6] is based on the medico-psychiatric study of 530 prostitutes at Copenhagen between 1931 and 1935, including a detailed account of 50 cases. As regards the causation of prostitution special stress is laid on the significance of hereditary factors, but the importance of environment, especially unfavourable conditions in the home, also receives attention. Of the conditions in adult life serving as causes of prostitution most importance is attributed to poverty and unsatisfactory working conditions, which accounts for general servants forming a considerable contingent of the total number of *propositae*, as Dr. Kemp prefers to call members of the oldest profession. It is noteworthy that psychiatric examination showed that only 29.4 per cent. were mentally sound and without defective intelligence, the remainder being more or less retarded or feeble-minded. About one-half had or had had some chronic physical disease which interfered with their capacity for work, the most frequent illness of the kind being gonorrhoeal salpingitis. The reforms proposed by the writer are closer supervision and if necessary institutional care of female mental defectives, closer co-operation of the morality police with public health authorities, and the improvement of working conditions for women, especially domestic servants. The translation from the Danish has been well carried out by Miss E. M. Werner Kornerup.

Mr. GEORGE RYLEY SCOTT'S *History of Prostitution*[7] is divided into three parts, devoted respectively to the causes of prostitution, its history, and prostitution as it exists to-day. As regards causation he rejects the view that poverty or lack of work is the main cause of prostitution, and maintains that the chief reasons are love of luxury and idleness. In his second part he deals with prostitution among savage and primitive races, religious prostitution in classical antiquity, India and West Africa, prostitution in the Bible, and the development of prostitution under civilization, with special reference to attempts at suppression and regulation. The third part is concerned with registered, unregistered, and clandestine prostitutes, traffic in women, venereal diseases of prostitutes, and male prostitutes. In conclusion Mr. Scott maintains that professional prostitution is declining and is being replaced by promis-

[4] *Der Endemische Kretinismus.* By Professor Dr. F. de Quervain and Professor Dr. C. Wegelin. Berlin and Vienna: J. Springer. 1936. (Pp. 206 ; 120 figures. R.M. 24 ; geb., R.M. 26.60.)

[5] *My Life and Work. The Search for a Missing Glove.* By Dr. Adolf Lorenz. New York and London: Charles Scribner's Sons, Ltd. (Pp. 362 ; illustrated. 12s. 6d.)

[6] *Prostitution. An Investigation of its Causes, especially with regard to Hereditary Factors.* By Tage Kemp. Copenhagen: Levin and Munksgaard. London: William Heinemann (Medical Books) Ltd. 1936. (Pp. 253. 12s. 6d. net.)

[7] *A History of Prostitution from Antiquity to the Present Day.* By George Ryley Scott. London: T. Werner Laurie Ltd. 1936. (Pp. 239. 10s. net.)

cuity between men and women of equivalent social standing, but he considers that prostitution in some form will survive for satisfying the sexual requirements of male perverts, senescents, and satyrs.

The little book entitled *The Second Oldest Profession*,[8] by Dr. BEN REITMAN of Chicago, is, as its subtitle states, a study of the prostitute's "business manager" or souteneur. It is a remarkably frank, full, and vivid description of this social parasite by one who is director of the Hobo College and Chicago School of Social Pathology, and has devoted the last seventeen years of his professional life of thirty-one years exclusively to venereal diseases and social problems.

Notes on Books

While experts fail to agree and politicians wrangle there is no dearth of amateurs who are prepared to be dogmatic about diet. It is perhaps not quite fair to class Miss C. MILLINGTON-LYMN as a complete amateur, but her little book on *Children's Diet* with its subtitle "A System of Dieting Children from Infancy as Carried Out at the Sophie Hine Nurseries" (London, W. H. Smith and Son, 1s.) would have been greatly improved if a paediatrician had been allowed to edit it. Unboiled milk, for example, is recommended without any warning that even certified milk may be dangerous for young children. Cod-liver oil appears to be banned, so that it is not surprising to learn that a case of rickets took ten months to cure (although this appears to be regarded as a good result). A more serious criticism is that only one milk mixture is recommended, and this is far too dilute except for the first two or three months of life. Stress is laid upon the inadvisability of using tinned foods, and yet a proprietary "broth" is advised instead of a home-made variety, and a proprietary "crust" appears in nearly every diet sheet. It would be unfair to recommend this book in view of these faults, and a protest must be made against the present tendency to decry all cereals. Good old-fashioned porridge has merits which appear to be forgotten.

[8] *The Second Oldest Profession. A Study of the Prostitute's Business Manager.* By Ben L. Reitman, M.D. With a preface by Dr. Harry Roberts. London: Constable and Co. Ltd. 1936. (Pp. 270. 8s. 6d. net.)

Medico-chemical Estimations,[9] by Dr. KARL HINSBERG, is a short textbook which describes all the outstanding methods in use. The volume is in two parts, and the second part, which has now been received, treats of the techniques which are of special importance for clinical laboratories. The methods are described very briefly, but references are given to articles containing fuller descriptions.

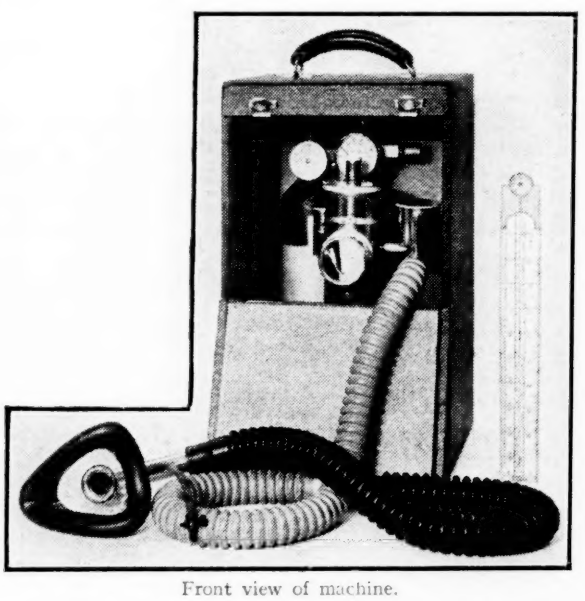
[9] *Medizinisch-Chemische Bestimmungsmethoden.* Teil 2. By Karl Hinsberg. Berlin: J. Springer. 1936. (Pp. 186; 48 figures. RM. 8.70.)

Preparations and Appliances

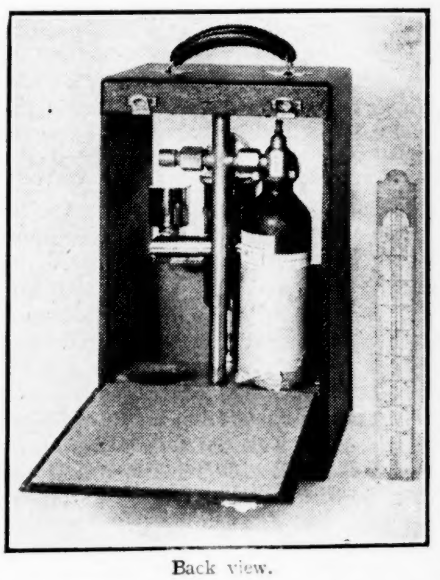
PORTABLE GAS AND AIR MACHINE FOR MIDWIFERY

Dr. H. ROLAND SEGAR, medical superintendent, The Wellhouse Hospital, Barnet, writes:

The value and safety of gas-and-air analgesia in labour are now well known, but many practitioners are deterred from adopting this method of giving relief in domiciliary midwifery because of the size and weight of apparatus. To overcome this difficulty there has been designed by the staff of Wellhouse Hospital a small portable gas-and-air machine. This takes one or two 50-gallon gas cylinders, and the whole apparatus complete with case weighs 20 lb.



Front view of machine.



Back view.

The machine itself is of new design, and because of its extreme simplicity should not get out of order. The gas pressure is reduced by passing through a chamber and coming in contact with a rubber diaphragm connected to a needle valve, and as this diaphragm is expanded by gas pressure the needle valve is forced into position and the flow of gas stopped.

When the patient inspires the pressure on the diaphragm is reduced and the needle valve rises, allowing more gas to flow. From the pressure-reducing chamber the gas passes through a carburettor, where it is mixed with the appropriate proportion of air. The carburettor is fitted with a float, which rises and falls as the patient breathes, rising on inspiration and allowing gas to flow, and falling on expiration, shutting off the flow of gas. Thus an intermittent flow is obtained. The proportion of gas in air can be varied by adjusting a screw at the top of the pressure-reducing chamber. This adjusting screw can be locked in any desired position and the machine thus set to deliver the required percentage of gas in air.

A high-pressure gauge is fitted to the apparatus to give an indication when the gas cylinder is empty.

The apparatus has been constructed at the Barnet factory of the Dental Manufacturing Company, and is sold by Messrs. Hawkins, 66, New Cavendish Street.

PUBLIC HEALTH IN THE UNITED STATES OF AMERICA*

I.—THE PUBLIC HEALTH SYSTEM

RALPH M. F. PICKEN, M.B., Ch.B., B.Sc., D.P.H.
MANSEL TALBOT PROFESSOR OF PREVENTIVE MEDICINE, THE WELSH NATIONAL SCHOOL OF MEDICINE

A British visitor to the United States is likely to be warned by his American friends against the assumption that a common language means community of thought or common sympathies. Early political dissension with ourselves has combined with immigration from all parts of the world and the natural peculiarities of the country to direct American development along lines which derive from no one of the older nations. The speed of that development in pioneering times has created problems of which there is little counterpart elsewhere, while prosperity arising from the adventurous exploitation of the country's immense natural resources has, until recently, kept out of prominence some of the conditions which lie at the core of physical deficiency among our own people. Nevertheless, law and administration in the U.S.A. have the same origin as our own, and, indeed, are not dissimilar, at least in the older States of the Atlantic seaboard.

Quite apart from the ease of communication which the use of the same language affords, a British student of public health methods finds himself more at home in the American system than in any part of the world outside the British Commonwealth of Nations. He finds within that system greater variation than he is accustomed to, because the forty-eight States are virtually autonomous and very jealous of their autonomy. He will not be very surprised at this, if he is familiar with the difference of law and methods as between England and Scotland and the urge for a degree of separatism in Wales. He may indeed be more struck with the direct executive functions of the United States Public Health Service in relation to such things as port health administration, hospitals and homes of certain kinds, and the inspection of meat intended for inter-State or international transport ; but he will realize that its activities in research, the spread of knowledge, and the establishment of biological standards are such as we also pursue through central government departments. On reflection, he may conclude that the executive functions of the Federal Government are an inevitable consequence of its inability to impose a measure of uniformity of methods on the States in matters which clearly concern the whole Union. He will note that an attempt on the part of the present administration to overcome recent emergencies by a combination of the extension of such executive action with financial subsidy to the States on prescribed conditions—the latter a feature of our own twentieth century policy, but so far used only to a small extent in the U.S.A.—labours under the threat of adverse legal decision, and that maintenance of the freedom of the States from central control is figuring largely in this year's presidential campaign.

Foundations and Voluntary Associations

Yet the Americans realize that separatism has its drawbacks. They are keen on attaining uniformity at least of a minimum level of efficiency ; but they do not appear to wish the central government to have power to impose standards of efficiency and to define the range of public health work. The latter, therefore, devotes much of its energy to investigation in laboratories and in the field, to the preparation of model State laws, and to the publication and dissemination of knowledge in every aspect of preventive medicine. Perhaps this freedom from routine peripheral entanglements is partly responsible for the volume and high quality of its scientific output. Benevolent bodies like the Rockefeller Foundation, the Milbank Memorial Fund, and the Commonwealth Fund, on the other hand, find their offers of help toward the establishment of model administrative systems welcomed, and voluntary organizations of a national character are more prominent and active in promoting uniformity of schemes than they are with us. Moreover, voluntary organizations of diverse kinds have come together both centrally and locally the better to exert their influence, occupying common premises and offering joint service, and, in some towns, sharing quarters with the local health department. The spirit of competition in efficiency between health departments is fostered by contests of one kind and another. No voluntary means is neglected of letting each health department know what is going on elsewhere, and of stimulating the public to spend money on the preservation of health. Almost unlimited effort is expended on inducing by voluntary means a degree of standardization which cannot be imposed by the Federal Government through its Public Health Service.

Prevention and Treatment—The Private Practitioner

In moving, therefore, from one State or local health department to another one finds uniformity of objective and, on the whole, a similarity of methods, although there is rather more variation in attainment than one would expect to find here. The emphasis is rather on the purely preventive side, since corporate schemes for treatment are at an earlier stage of their evolution in the U.S.A. than in Great Britain. So that if we compare the public health organization of three peoples with a somewhat similar outlook and ideals, we find the accent on treatment in Scandinavia—with its splendid and long-established system of State and local hospitals—and on the prevention of disease and public education on health in America ; while in this country we steer a middle course, as in so many other matters, and present, perhaps, fewer " high spots " to the observer than in either of the other countries. In both English-speaking countries the voluntary hospital system dominates the field of treatment and still stands outside State medicine ; in both of them recent financial exigencies have raised doubts as to whether it can continue to hold this position. In both, the general practitioner's key position in relation to prevention is recognized, but he is used more in its service in America, and it would appear that more is being done at the present time to bring him into the public health fold and to fit him for it. On the other hand, one gathers that community of ideals as between the public health branch and the rest of the profession—for instance by co-operation within such an organization as the American Medical Association—is less evident than with us. Such division of policy as may exist, however, seems to be less prominent locally than nationally.

Central and Local Government

It is unnecessary for our purposes to enter into all the intricacies of government in the U.S.A. The United States Public Health Service, which is attached to the Treasury Department, is not the only statutory central organization concerned with health. The Department of the Interior, through its Bureau of Education, deals with matters relating to the health of the school child ; child welfare falls within the province of the Children's Bureau in the Department of Labour ; the Bureau of the Census is attached to the Department of Commerce ; and there are many aspects of health which are subject to scrutiny by other Government departments. This dispersion is, of

* This is the first of a short series of articles on public health in the U.S.A., contributed by invitation.

course, not peculiar to the American system, and has arisen partly in the natural course of evolutionary government and partly from the impossibility of devising a perfect scheme of unification, as the history of our own Ministry of Health shows. A measure of co-ordination is attained by seconding officers of the Public Health Service to other central departments for engagement in their medical work.

In considering the State health organization it should be appreciated that the majority of the forty-eight States are not more populous than the largest English counties, although their areas are usually much more extensive. The governmental system of any one of them is therefore hardly more comparable with that of England and Wales as a whole than the Federal Government is. In addition to legislative functions and the distribution of grants, they also assume executive responsibility. They provide, for instance, a laboratory service and biological products, almost all the mental hospitals in the country, and some general and tuberculosis hospitals ; occasionally staff district health units ; and conduct special surveys or campaigns for immunization. Their activities, therefore, in the latter respect, are not unlike those of our counties, but their legislative powers are practically as great as those of our central government.

Within the States the usual administrative units are counties, cities, and villages, townships, or precincts, although special districts may be created for specific purposes by combination of the above units or otherwise. As there are about 3,000 counties in the U.S.A. (aggregate population about 120 millions) as compared with sixty-two in England and Wales (about forty million persons), it will be realized that the average county is a much smaller entity than with us as regards population, resembling our county districts. Efficient administration is attended by difficulties similar to those which have led to the gradual supersession of county district councils by county councils in Great Britain. Cities consist of aggregated communities of very varying size, New York and Chicago being comparable with London ; but many of them are not larger than our small boroughs or urban districts. Villages, townships, or precincts resemble our parishes in size. Any one of these units may have responsibility and exercise power in relation to the public health. The extent to which they do so varies from State to State. In New York State a number of health districts have been formed, each including several counties, and the same movement can be seen in Massachusetts and Maryland ; in Massachusetts most of the counties have no health organization whatever, townships (of which there are more than 300 in the State) managing their own affairs in a manner and by means reminiscent of England at the beginning of last century, except in the few instances where districts have been formed by combination. It is into this framework that a public health service has to be fitted. Broadly speaking, the federal State, municipal, and county units are those which matter, and among the last two efficiency is still hampered by the small size of some of them and only attainable by the intercession of the State, or sometimes even by the federal, health departments—just as the county in England and Wales helps, and may even supersede, the smaller district organization.

Public Health Administration

We have seen that the principal federal agency is the United States Public Health Service, a bureau within the Treasury Department at Washington. In each of the States a nominated board or department of health is concerned with the public health, assisted sometimes by an advisory council. This department is usually responsible for the compilation of statistics of births, deaths, and marriages, in addition to other records of public health interest, a function also assumed for the whole country by the U.S. Public Health Service. Boards of health appear to be commonly appointed in counties and municipalities, but in the former they are often not very active. Generally speaking local administration by elective bodies actively and continuously functioning through their appointed officers, as in Great Britain, is not the custom in the U.S.A. The health officer or commissioner in large cities, for instance, is usually responsible either directly to the mayor or to a board of health consisting of members nominated from time to time by successive mayors. Occasionally he is, with other heads of departments, answerable to a city manager, who is responsible to a small council for the whole of the city's affairs. Even within any one State the county and municipal public health system is not uniform.

Personnel of the Services

The U.S. Public Health Service is in itself a large organization, with a staff of about 5,000, all told, on a civil service and pensionable basis with security of tenure. The Surgeon-General alone, who is at its head, enjoys no guarantee that he will retain that office when changes in the Government occur. As is usual in central departments the organization is specialist in character, with senior officers at the head of each section, but it also carries a large number of whole-time and part-time officers working in districts throughout the country.

In about half the States a health officer, whose designation varies (for example, commissioner or director), is appointed by the governor, and in the other half by a board of health. A gubernatorial appointment in some cases is subject to confirmation by the senate or executive council. In Alabama the appointment is made by a committee of public health and confirmed by the State Medical Association. The officer usually has no security of tenure, and this disability may be shared by his chief assistants, even in those States where the rest of the staff are under civil service conditions. The staffs of the State health departments may be very large. In New York, for instance, there are more than 200 officers in the laboratories alone. They are usually distributed in specialist bureaux.

In municipalities the variation in appointment and conditions of service is even greater. Almost always the health officer is appointed by the mayor or by the Board of Health for a limited term of years. In the small cities the office is usually part-time. Even among larger cities about 30 per cent. still employ part-time health officers. In principal cities, like New York, Chicago, Baltimore, and Boston, the organization of the health department resembles that of the States. The health officer may also be registrar of births, deaths, and marriages, an arrangement which is favoured. There is an interesting tendency to devolve all executive work of a preventive character to districts, each with a staff operating from a clinic as centre.

The majority of county health officers are engaged in private practice, although there is a vigorous movement toward whole-time appointments under State stimulus and assistance. So far less than 600 of the 3,000 counties have whole-time officers with departments under them. They do not enjoy security of tenure.

Qualifications; Lay Officers, etc.

In any of the above organizations, except the U.S. Public Health Service, the chief executive officer for health purposes is not necessarily a qualified medical man. In cities and counties it is not uncommon for the health officer to be non-medical. The tendency, however, is definitely toward the elimination of such appointments.

Under the New York State Sanitary Code of 1932 every health officer appointed after that date must be medically qualified. Where laymen hold the position, especially in large communities, they have frequently had a scientific training and hold some special qualification in sanitary science.

Although the majority of health officers are medically qualified, few among those in responsible positions in cities or counties have had special training or hold a qualification in public health. Among the younger men in large departments, however, this is not the case. To an increasing extent entrants to the service undergo preliminary training, and men and women already engaged in it, especially in whole-time county appointments, are being seconded for periods of special training. The nature of these courses will be dealt with in a later article.

Remuneration, Appointment, and Security

One of the difficulties which have beset the development of the health organization in the U.S.A., from the Federal Public Health Service downward, has been the low rate of salaries as compared with the average earnings of practitioners in other branches of medicine. Although a few of the large States offer salaries comparable with those received by the medical officers of health of the largest English counties, the average compares unfavourably with that in this country at the present time when the cost of living is taken into account. Perhaps as the result of the great reduction in the earnings of private practice in the recent lean years there seems to be less reluctance than might be expected on the part of able young men to undergo prolonged post-graduate training and seek entrance to the service.

The absence of security of tenure does not seem to cause so much concern to the American mind as it would with us. There appears to be less risk than one has been led to believe of a competent officer's losing his position because of changes in the personal or political complexion of local government. Boards of health, or public health councils which are responsible for the conduct of public health affairs, are often so constituted that their composition cannot be suddenly changed, and this gives a measure of security to the health officer. While also it is possible for appointments to be made in an arbitrary fashion in some areas, the governors, mayors, or boards of health sometimes obtain assistance by setting up committees of experts to advise them. It is not at all certain that appointments in the U.S.A. are less dependent upon merit than they are under our apparently more democratic system. The quality and character of most of the men in responsible positions suggests that they are not. Insecurity may cause health officers to have an eye keenly bent on the good will of the public, but, within limits, this may not be a bad thing. In looking for an explanation of the publicity in which some health departments figure, one must remember that the Americans have a genuine faith in advertisement as an administrative as well as a commercial tool, and we seem to be slowly moving to the same point of view.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

(*Concluded from page 603*)

PSYCHOLOGY AND CIVILIZATION

Sense of Guilt

On September 10th, in the Section of Psychology, Dr. WILLIAM BROWN, Wilde Reader in Mental Philosophy and Director of the Institute of Experimental Psychology, University of Oxford, discussed freedom and moral obligation. He drew attention to the exaggerated conscientiousness and self-reproach shown by many people with regard to certain aspects of duty. Analysis might reveal that while there was nothing amiss in their conduct in the direction which their anxiety took, there were important defects of character elsewhere ; patients often worried about the wrong thing. Ethical fervour was concentrated along certain lines, whereas real shortcomings, which the patient was subconsciously trying to conceal, might be in another and altogether different direction. Dr. Brown suggested that some of those who paid "conscience money" to the Exchequer were salving their consciences not for some fraud, which might or might not have been practised upon the tax-gatherer, but for some other fault. There were many who, unable to face their own real weakness, shifted their ground and blamed other people and projected upon them their own guilt. A sense of guilt—not merely of fear—might cause or prolong organic illness. He instanced one patient who suffered from recurrent corneal ulcers, and laboured under the delusion that he had blasphemed and that blindness was the penalty for blasphemy. Censorious people, he said, were people who, instead of dealing adequately with guilt in their own minds, projected it upon those around them. Dr. Brown contrasted the attitude of the psychologist in regard to moral obligation with the attitude of the purely metaphysical moralist. Emanuel Kant's ethical generalization, "I ought ; therefore I can," from the psychological point of view, might well be reversed: "I can ; therefore I ought." That was the kind of attitude needed at the present moment to change what was unsatisfactory in the life about us. Psychology was pointing the way to a heroic future.

Mass Entertainment

Mr. D. W. HARDING of the London School of Economics analysed 215 replies, chiefly from workers attending adult education classes, yielding information on the psychological conditions in which the desire for entertainment was felt most strongly. These replies fell into three broad groups. The first included those who wanted entertainment as relief from fairly simple tiredness after work ; in these there was no very marked emotional element. In the second the desire for entertainment was stimulated by some unpleasant emotional state. This was a rather large group. Ninety-seven people mentioned boredom and staleness, eighty-five depression arising from loneliness, disappointing work, and various other causes. The third group consisted of those who wanted entertainment when they were feeling cheerful, elated, or energetic, or when their social contacts had been pleasant or stimulating. Several considerations suggested that a feature common to the entertainment demanded in all three groups was that it should offer an immediate and direct reward for the effort, whether great or small, that it required. This was its unfailing contrast with almost all modern work. All entertainment might be serving one or both of two functions. On the one hand it might be a pleasing pursuit followed for the direct satisfaction it offered ; on the other hand it might be an escape mechanism. This latter view, however, appeared to have only a very limited validity. An important intrinsic appeal of entertainment lay in its offering the audience an easy and gratifying social situation.

Mr. F. G. THOMAS, assistant director of education for Blackpool, spoke of the appeal of the modern amusement park or pleasure beach to the "fear-escape" propensity, the most effective exploitation of which was seen in those amusements apparently fraught with extreme physical danger but offering an infallible means of escape. Modern showmen catered in three ways for the sex factor in mass entertainment. First, by placing the pleasure-seekers in situations where the protective and appealing impulses of the male and female respectively could have

full play ; secondly, and rather morbidly, by the exhibition of people in barrels or glass cases ; and thirdly by indirect manifestations of masculine strength.

Use and Abuse of Examinations

On Monday, September 14th, in the same Section, the reform of the examination system was discussed. Professor MADISON BENTLEY, an American visitor from Cornell University, who took the chair, described the subject as peculiar to the British educational system. Dr. LL. WYNN JONES of Leeds University described examinations as a part of real life, an institution which society had evolved to solve specific social problems. The system was one which implied flexibility and compromise, and should not be impeded by laxity and abuse on the one hand and cast-iron pig-headedness on the other. He suggested that there should be an increased use of standardized tests of intelligence ; there was need of a sufficient number of psychological testers adequately trained in the technique of examining. Further large-scale researches such as those initiated in Leeds a year ago—to compare the prognostic values of tests of intelligence, tests of special abilities, tests of attainment, school records, teachers' estimates, etc.—were necessary.

Professor H. R. HAMLEY of the Institute of Education said that we had never clearly formulated our examination aims, or if we had we had lost sight of them. The school-leaving certificate was accepted by the business world as a guarantee that a boy or girl had attained a certain cultural standard, by the university as an indication that he or she would profit by a higher education. These views were not necessarily incompatible, but public examinations varied enormously in the degree with which they fulfilled these two criteria. School certificate examinations should include tests of knowledge acquired, measuring honest but modest attainment in certain fundamental subjects, and tests of educable capacity, measuring also aptitude or specific ability in a subject of the candidate's choice. In conclusion Professor Hamley pleaded for broad and comprehensive research on the problems of examinations and the conscientious application of the results obtained.

Modern Civilization

On September 15th, in opening a discussion on the strain of modern civilization, Lord HORDER said that strain was the penalty we paid for living at all, but there was implicit in the title of the discussion the suggestion that the strain of modern life had new elements and was excessive. Functional disease, as against organic, had increased. In case after case a tactful pursuit after fundamental causes revealed headache, insomnia, indigestion, and fatigue as being due to an anxiety factor. The competition of living, the increasing sense of international insecurity, the pace at which we lived, and the precariousness of life itself were all such that in these days we seemed to live by accident rather than to die by it. Science was held largely responsible for much of the strain of modern life. Actually it was not too much science, but too little ; science had loaded man with benefits, but he had shown an indifference to them or a carelessness and a prodigality in the use of them which was pathetic. We need not drive a car so fast that it killed, nor make a loud-speaker so loud that it deafened. Science was made for man, not man for science, and the one thing that mattered was control. Among remedies for the ill effects of the strain of modern life he placed first more science, and especially science directed toward the study and development of the mind and spirit of man. There was little hope for the people in mass movements, whether fascist or communist. When individual freedom had been sacrificed he saw no chance of achieving that control in the spiritual sphere from which alone he believed salvation could come to the human race. In conclusion, Lord Horder said that he had not attempted a prognosis of modern ills. He had only restated his faith in the individual and in the enormous potentialities of the human spirit. If doctors had a political colour it must needs be liberal. He spoke without prejudice, but thought that a rebirth of that spirit in British political life would be one of the best medicines that our strained lives could have administered to them.

Nervous Breakdown

Dr. R. D. GILLESPIE spoke of modern civilization in its relation to nervous and mental breakdown. An analysis of 500 consecutive cases of nervous and mental illness showed that overwork, to which such breakdowns were often attributed, was an important or causal factor in only ten instances, or 2 per cent. Usually the causes were more personal and had to do less with external stress or strain than with personal unhappiness and mental conflict. Overwork without personal satisfaction from it tended to produce functional nervous breakdowns. Unemployment was not such a frequent factor in producing breakdown as one would expect. What was required as a rule was not a diminution in the pace of life, but a better technique of living, which implied a better type of education and upbringing.

Dr. E. P. POULTON thought that there were two opposing factors in modern strain. The first factor, which increased the strain, was the rise in the standard of living, and the second, which should diminish it, was that the luxuries, no less than the necessities of life, were requiring fewer people and shorter hours for their manufacture, so that there was more spare time available. The fault lay in the failure of distribution and in defective education, so that those who had leisure were often unable to profit from it. In England and Wales the last time " the net reproductive rate " was above 1 was in 1925. In 1933 the rate had been reckoned as not much above 0.75 (Dr. Enid Charles). The average family should contain 3.1 children of both sexes to make a stationary population. In considering diet Dr. Poulton said most adults had a tendency to overfeed. Most people tended to put on weight as they became middle-aged. Was this physiological or should a man of 50 preserve his youthful weight and figure? The effects of tobacco and alcohol were considered, and Dr. Poulton suggested that the variability of the content of alcohol in a cocktail was its main disadvantage as compared with a glass of sherry or beer.

Modern Industry

Miss E. M. KILLICK contributed a paper on some health hazards from toxic substances in modern industrial civilization. She regarded carbon monoxide as one of the most important of these substances, because it was the most frequently encountered. The list of toxic products and by-products to which workers might be exposed during industrial processes increased almost daily. Prolonged exposure even to very low concentrations of toxic gases was thought to be a factor in reducing the normal reserve capacity of the body in response to unusual strains.

FOTHERGILL TESTIMONIAL FUND

FINAL LIST OF SUBSCRIBERS

As previously announced this fund is now closed, and the following is a final list of subscriptions:

	£	s	d.
Wigan Division	8	17	0
Brighton Panel Committee	52	10	0
F. W. Goodbody (London)	1	1	0
S. L. Brimblecombe (Stoke-under-Ham, Somerset)		10	6
Cambridgeshire Local Medical and Panel Committee	5	5	0
East Ham Panel Committee		5	0
West Ham Panel Committee	20	0	0
Essex Panel Committee	14	0	6
G. E. Hyden (Worthing)	1	1	0
	£103	10	0

The total amount subscribed was £1,683 6s.

British Medical Journal

SATURDAY, SEPTEMBER 26th, 1936

THE FUNCTION OF THE DISEASED KIDNEY

For many years physiological teaching on the kidney was based on a theory of renal secretion, but in the last twenty years the teaching of Ludwig, modernized by Cushny, that the function of the kidney is filtration through the glomeruli and reabsorption through the tubules, has become increasingly accepted. Professor Govaerts of Brussels has thought it advisable to summarize his life-work on renal function, and to present in a judicial way the applications in clinical medicine of the modern views.[1] Dr. R. Platt, who has worked and written much on the subject, gave an admirable summary of the facts in his contribution to this *Journal* last May.[2] Filtration through the glomeruli depends upon the blood pressure in the renal artery and upon the number of glomeruli functioning at the time of observation. The watery filtrate thus produced is concentrated more or less during its passage through the tubules, and the rate of flow through these as well as the state of the tubular cells determines the composition of the urine which reaches the ureter. The glomerular origin of albuminuria may explain best the evolution of renal disease, and tissue oedema appears to follow the retention of chlorides and the diminished blood proteins through loss of albumin. The origin of the hypertension of nephritis is not fully explained.

Accepting Cushny's theory as a true description in the main, Govaerts considers in detail the problems of diuresis, of albuminuria and oedema, showing how the observed facts fall into a connected story when looked at from this point of view. He then discusses the various methods of testing renal function that have been devised. The simplest in theory is the diuresis test, first giving large quantities of fluid and investigating the amount and specific gravity of the urine passed, and then giving little fluid to secure the maximum concentration. The test is, however, empirical. In the presence of much oedema, where there is delayed emptying of the stomach or absorption from the intestine, with any partial obstruction of the urinary passages or the associated vomiting and diarrhoea of uraemia, and with any cardiac decompensation, practical difficulties arise in carrying out the test and interpreting the results. This test may, however, give early indication of the beginning of renal insufficiency, and in theory and application it is compatible with the filtration-reabsorption theory. It has long been felt that the excretion of some harmless and readily recognized colouring matter or chemical might give the desired information. Rehberg chose creatinine as a suitable chemical substance, believing that its excretion was in direct relation to the glomerular filtration and gave a measure of the volume of this filtrate. Govaerts's observations on healthy people and nephritics gave results which would conform to those expected on the filtration-reabsorption theory, and the behaviour of substances like glucose which have a renal threshold likewise fits in with this theory.

The early pathologists were led by their observations to a dualist classification of renal disease, drawing a fundamental distinction between parenchymatous nephritis and interstitial nephritis, the former characterized anatomically by the large white kidney, and the latter by a progressive evolution towards the contracted red kidney. But the difficulty of bringing these observations into line with cases observed at the bedside led to a divorce from pathological classification, clinicians preferring to adopt one conforming to the syndrome which dominated the clinical picture. Widal and his school distinguished four functional disturbances in Bright's disease: albuminuria, oedema, uraemia, and hypertension. This conception offers a picture that appeals to the clinical point of view, placing in relief each of the four fundamental aspects that Bright's disease presents to the clinical eye. Nevertheless Widal's teaching gives no satisfying explanation of the way in which a renal lesion may bring about the appearance of one or other disturbance ; indeed Widal despaired of establishing a relation between the disturbances of function and the anatomical change in the kidney. The final step on this road of clinical classification was Friedrich Müller's proposal to divide kidney affections into degenerative and inflammatory lesions. The degenerative form (nephrosis) was characterized anatomically by various changes in the cellular structure, generally considered to be necrobiotic, hyaline, fatty, vacuolar ; and in these forms the urine contained large amounts of albumin with few casts or cells. There was a great tendency to oedema, but neither uraemia, hypertension, nor retinitis. The inflammatory lesions (nephritis) had anatomically vascular and interstitial changes and led to uraemia, hypertension, and albuminuric retinitis. Pathologists from the outset would have none of this, and clinicians were confronted by several difficulties. Certain cases of nephritis of undoubted inflammatory origin could follow for a long time the course of so-called nephrosis, presenting massive albuminuria without casts or cells in the deposit, gross and persistent oedema without uraemia or hypertension. Usually after a longer or shorter time signs of retention of urea and creatinine supervened, though these might be deferred for years. Pure nephrosis tends therefore to be very rare if cases are followed long enough. And—a greater difficulty—the symptoms may be identical whether the degenerative lesions are mainly tubular or mainly glomerular. Indeed, in all cases the kidney anatomically shows a mixture of areas or portions where the blood vessels, glomeruli, tubules, and connective tissue are involved. Cordier, one of Govaerts's assistants, studied the kidneys from a patient

[1] *Le Fonctionnement du Rein Malade. Recherches Expérimentales et Cliniques.* By Paul Govaerts. Paris: Masson et Cie. (25 fr.)
[2] *British Medical Journal*, 1936, i, 987.

showing the pure syndrome of nephrosis, and found undoubted signs of involvement of the glomeruli, and Dunn in this country independently came to the same conclusions.

We come thus to a conception of the essential renal element as a nephron, consisting of a glomerulus and attached tubule with a special form of blood supply. In all forms of nephropathy there is a functional alteration of the glomerulus, and consequent changes in the tubule which leads from it. Depending on the filtration pressure and the rate of flow of the filtrate through the tubules, there is a greater or less reabsorption through the cells lining the tubules, and therefore modification of the composition of the fluid which reaches the collecting tubules and calices. The experimental work of the last ten years on the kidney has been considerable. Renal disease, as Widal used to point out, is making experiments for us to observe day by day. To interpret these observations and co-ordinate them with laboratory experiments, it is necessary for clinicians to think in terms of physiology.

STERILIZATION OF CATGUT

The recent occurrence of a total of nine cases of post-operative tetanus in three different hospitals in this country has led to the publication by the Ministry of Health of a memorandum[1] drawing attention to the danger of using catgut supposedly sterilized by methods which have long been known to be ineffective. This memorandum is a digest of the more detailed paper read by Sir Weldon Dalrymple-Champneys to the Surgical Section of the Royal Society of Medicine in February last.[2] Since 1930 a regulation made under the Therapeutic Substances Act has ensured that material sold as sterilized surgical catgut shall have been properly treated to secure sterility; the only present danger is from "raw" or so-called "partially" or "internally" sterilized catgut which is to be finally sterilized by the user. It is perhaps even now not generally recognized that the destruction of highly resistant spores embedded in a material such as catgut is one of the most difficult of all problems in chemical disinfection, and that the demonstration of its achievement by cultural methods is beset with pitfalls, which in the past have led to innumerable errors.

In Bulloch's masterly review,[3] which made all the necessary information on this subject available seven years ago, there is page after page of patient exposure of the inefficacy of many methods on which reliance has been placed in the past, and of the constantly recurring error due to performing sterility tests with material still impregnated with an antiseptic. Only three agencies will destroy spores in catgut without destroying the gut itself; these are heat, hydrogen peroxide, and iodine. The secrets of applying a sufficient degree of heat without excessive damage to the gut is known only to certain manufacturers, and hydrogen peroxide is adaptable only to an early stage of the manufacturing process. Iodine, therefore, remains the only effective reagent applicable by the user, and it has to be employed in a certain way. Long after Claudius, whose solution is still often used, had demonstrated that iodine is only effective in watery solution, it was recommended by various writers that the iodine should be prepared in spirit; such solutions are ineffective. The method of treating catgut differed in each of the three hospitals in which post-operative tetanus has occurred recently. In one, the gut was boiled in xylol for half an hour and stored in spirit; in the second it was placed in oil of cloves for fourteen days and in absolute alcohol for eight days, or, in the case of chromicized catgut, it was immersed in a solution of 1 in 250 mercury biniodide in absolute alcohol for eight days. In the third, so-called "internally sterile" catgut was treated, according to a recommendation by the manufacturer, by immersion in 5 per cent. carbolized alcohol for "not less than forty-eight hours": the author of instructions which reckon the period of effectiveness of this solution in hours will perhaps by now have had his attention drawn to Bulloch's observation that ligature material was still not sterile after immersion in 5 per cent. carbolic acid for twenty years. Years, and not hours or days, represent the capacity for survival of bacterial spores, not only in this solution, but in spirit and in solutions of binoidide of mercury, both stronger than those commonly employed and maintained at incubator temperature to accelerate their action.

These unfortunate occurrences, and the publicity which they have now received, should go far to brush away the final cobwebs of misapprehension on the subject of surgical catgut. Anyone buying raw gut is assuming a serious responsibility, and "home-curing" methods, even if their results have hitherto been so fortunate as to give satisfaction, should be brought into line, if necessary, with present-day knowledge. The same treatment as for raw gut is evidently required for the so-called "partially sterilized" or "internally sterilized" catgut. These seem to be misleading terms, and there is a case for official action either to abolish their use or to restrict it to products made under licence.

SPECIFICITY OF SEROLOGICAL REACTIONS

Professor Karl Landsteiner is probably best known throughout the world for his pioneer studies on the blood groups. Medical men perhaps do not generally realize that his work on blood groups is only, so to speak, a by-product of his life-work, which has been the investigation of the chemistry of serological reactions. He now gives us a concise account of the progress up to date in his experiments on antigens and serological reactions with simple compounds, and also discusses those phenomena of specificity which have not yet been fully explained.[1] The matter is

[1] Ministry of Health. Memo. 199. Med. August, 1936.
[2] *British Medical Journal*, 1936, i, 328.
[3] Medical Research Council, Special Report Series, No. 138, 1929.

[1] *The Specificity of Serological Reactions*. By Karl Landsteiner, M.D. London: Baillière, Tindall and Cox. (18s.)

highly technical, but the elementary concepts and phenomena of serology are explained for the benefit of readers in other specialties; the bibliography is wide enough for the use of workers in Landsteiner's particular field. Ever since immune reactions were discovered, medical men have been inquiring into the reasons for them, and the search led to the discovery of antibodies—protein substances which are formed not only as the result of infection but also after the administration of dead bacilli and of toxins from bacilli and some of the higher plants and animals. It was then realized that immunization against microbes and toxins is only a particular instance of a general principle, and that when innocuous materials such as foreign proteins are injected into animals the same mechanism operates: antibodies appear in the serum and cause the clumping or disruption of cells or the precipitation of soluble proteins. Immune antibodies have in common the property of specificity, reacting only with antigens identical with or similar to those used for immunizing.

Specific proteins are now known to characterize every species of animal and plant, and Landsteiner's endeavour has been to define this specificity in chemical terms. His chapters roughly correspond with the development of the subject. After discussing the serological specificity of proteins, cell antigens, and antibodies, he passes to artificial conjugated antigens, and investigates the serological reactions of aromatic compounds and the specificity of stereo-isomeric compounds. He says that conclusions can already be drawn from the correlation between serological reactions and chemical structure, but that no finished theory has been attained which will compare with those that cover the ordinary phenomena of chemistry. Even the formation of organic molecular compounds cannot always be rationally interpreted, and there is the further difficulty that the chemical structure of the antibodies is practically unknown. In velocity and easy reversibility antigen-antibody reactions differ from those due to primary valencies and resemble the formation of ionic and molecular compounds. A strong argument against the assumption of covalent bonds is the fact that quite different substances, regardless of their chemical nature, are capable of reacting with antibodies all in the like manner. He concludes with a chapter on the immunological specificity of polysaccharides, on chemical investigations of specific non-protein substances of animal origin, and on serum reactions with phosphatides and sterols, a study which has a bearing on the question of the lipoidal nature of primarily alcohol-soluble haptenes, for these substances and chemically known lipoids are the only materials which appear to acquire antigenicity by the addition of proteins. If these substances are indeed antigenic, Professor Landsteiner remarks, it would not be surprising if immunization effects of a similar sort could be obtained with other compounds. Investigation along these lines may be helpful in studying the problem of the dependence of antigenic activity on chemical structure.

SHOCK TREATMENT IN SCHIZOPHRENIA

In recent years several therapeutic procedures have been used with a view to stimulating normal reactions in psychotic patients. The term "shock" is applied to these measures, since, like febrile illnesses, they are intended to ameliorate mental disease by submitting the organism to severe physiological stress. Fixation abscesses have been induced in schizophrenia. (The fixation abscess is a collection of pus artificially produced by the injection of turpentine (1 to 2 c.cm.) under the skin of the flank.) In 1929 Shroder advocated injections of sulphosan in dementia praecox. Since then several clinicians have employed this method of treatment in schizophrenic and other types of mental disease. A few years ago considerable interest was aroused by the work of Kläsi, who advocated somnifen as a therapeutic agent in the psychoses. The aim was to keep the patient in a twilight sleep. The sleep resembles that of epidemic encephalitis—the patient can be roused to take nourishment or pass excreta, and drops off again when left quiet. Amytal has been given by American psychiatrists with a certain amount of success. The most recent work on these lines has been investigated by Dr. Isabel G. H. Wilson[1] at the request of Sir Laurence Brock, the chairman of the Board of Control. During a stay of nearly three weeks in Vienna Dr. Wilson had the opportunity of working at the University Neurological and Psychiatric Clinic, where insulin treatment (hypoglycaemic shock therapy) is carried out by the physicians holding appointments there, in collaboration with Dr. Sakel and under the direction of Professor Dr. Otto Pötzl, who is now head of the clinic in succession to Hofrat Professor Wagner-Jauregg. She was also able to see a few patients under treatment elsewhere in Vienna. There would seem to be no doubt that the treatment is unpleasant for the patient. The hunger, sense of chill, and drowsiness before the coma, and the feelings of anxiety, confusion, and distress in the process of waking, are obvious to the onlooker. Against this is to be set the amnesia, which wipes out the greater part of the hypoglycaemic events from the minds of many patients. Dussik and Sakel say: "With few exceptions they do not call the treatment unpleasant." Müller remarks: "On the whole the complaints are very few, and the five cured cases have said they did not regard the treatment as particularly unpleasant." Professor Pötzl considers that the method is not without danger and that it is difficult to learn. In conversation with Dr. Wilson he said: "I think it is true to say that every patient runs a risk to his life, as in a surgical operation, but that is all. A mortality of 3 in 200 is not very high." Professor Berze in 1933 also referred to the very real danger of this method. On the other hand, Ederle is of opinion that the occasional epileptiform attacks which occur are easy to manage and should not deter workers from investigating the matter further. Dr. Wilson's impression from discussions with many doctors experienced in the method is that with increased knowledge and vigilance the complications are becoming less serious and more manageable than they seemed to be at first, and her observation of the treatment of patients confirmed this

[1] Board of Control (England and Wales). *A Study of Hypoglycaemic Shock Treatment in Schizophrenia.* Report by Isabel G. H. Wilson, M.D., D.P.M., Medical Commissioner of the Board of Control. London: H.M. Stationery Office. 1936. (1s. 3d. net.)

view. Although risk to life probably cannot be avoided altogether, the risk seems to be justifiable in view of the seriousness of the illness to be treated. Only time will show whether this new therapeutic method is of greater value than those referred to above.

LEAGUE OF NATIONS HEALTH BUREAU

The ninety-third session of the Council of the League of Nations, which opened last week (writes our Geneva Correspondent), is the first to be held in the League's new building. The deliberations are taking place to the accompaniment of hammers and drills, for the palace is still far from being finished. The meeting, which was made significant by the presence of Spain and the absence of Italy, and by such items as Danzig and the Saar on the agenda, opened quietly enough with the consideration of those aspects of League work with which nobody quarrels. The report on the health activities was made by the Danish representative, Dr. Munch, and was chiefly concerned with the recent meeting of the Health Bureau at Moscow, where, evidently, an excellent impression of Soviet health organization was obtained. Members and experts made a tour of the country, visiting Leningrad, Gorki, Tiflis, Sevastopol, Kief, and other places, studying public health alike under the Union and under the autonomous republics, and including urban and rural hygiene and the hygiene of household and farm. Dr. Munch said that the tour, which might be regarded as forming part of the system of liaison between health administrations, provided abundant and varied instruction, and he called upon the Council to thank the Government of the U.S.S.R. for its generous hospitality, and to express appreciation of its concern for international co-operation in the field of health. The principal work of the Health Bureau included a further programme for rural hygiene, the consideration of reports from the commission on nutrition, and the procedure to be followed for organizing, in conjunction with the International Institute of Statistics, the preparatory work for the forthcoming decennial revision of the international list of diseases. On this last subject it is proposed to invite suggestions from the different Governments as to the amendment of the lists, especially with a view to improving the international comparability of statistics in such respects as the selection of joint causes of diseases and the arrangement of age groups in populations. The traffic in dangerous drugs also engaged the Council's attention. The Portuguese representative, M. de Vasconcellos, reporting on this subject, said that while the supervision of legitimate manufacture of narcotic drugs had been remarkably successful in reducing such manufacture to the level of the world's requirements, it had at the same time driven illicit traffickers to obtain supplies from clandestine sources, so that there was an alarming increase in clandestine manufacture in general. The supervision had also had the effect of driving the traffickers to regions where, for the moment, control was difficult and inadequate, and raw material easily accessible: hence a state of affairs in the Far East which was growing more and more serious every day. During the last seven years fifty-four clandestine factories or laboratories have been discovered and suppressed, most of them in the Far East—twenty-one in Shanghai alone—but a number in Europe, and one in the United States. Surreptitious manufacture exists and is increasing in a great many provinces in the Far East, particularly in Manchuria and Jehol. The responsibility for the position in these territories belongs in the main to Japanese and Korean traffickers, on whom the Japanese consular authorities are powerless to inflict any but the lightest penalties.

AN EXPERIMENT IN MILK CONTROL

The bacteriological examination of milk sold in the Royal Borough has for many years been carefully attended to by the medical officer of health for Kensington, on the instructions of the Public Health Committee of the Council, and his reports have often been fertile in good ideas. As illustrating the great importance of pasteurizing all milk, and especially that which has been brought into the area in bulk, some figures recently submitted in Kensington are most instructive—if, indeed, the Bournemouth epidemic leaves any need for further instruction. Eight samples of "certified" milk recently examined bacteriologically were very satisfactory, as were two of "Grade A, Tuberculin Tested"; but a third sample of the latter was found to contain 546,000 organisms per c.cm., with *B. coli* present in 1/1000 c.cm. A further eight specimens of "pasteurized" milk had low bacterial contents, though *B. coli* was reported to be present in three of them. Lastly, two reports on raw milk disclosed respectively 410,000 and 720,000 organisms per c.cm., with *B. coli* present in 1/1000 c.cm. in both cases. An experiment was then carried out by sampling raw milk from a number of farms delivered in London in bulk in a glass-lined tank: 768,000 bacteria per c.cm. were found, with *B. coli* and *B. tuberculosis*. Three separate samples were then taken at varying intervals after pasteurization was complete, disclosing respectively 990, 1,610, and 2,720 organisms, with no *B. coli* and no tubercle bacilli. Yet another sample taken after the milk was bottled showed 2,500 organisms, with *B. coli* present but *B. tuberculosis* absent. Apart from proving the efficiency of the pasteurizing plant, the result suggests that the bottles had been imperfectly cleansed.

NATIONAL COLLECTION OF TYPE CULTURES

The valuable service which the Medical Research Council renders to microbiologists by maintaining the National Collection of Type Cultures must be so well appreciated as to make any reference to it almost superfluous. For this service bacteriologists and mycologists, not only in this country and the Empire but in other parts of the world, are deeply indebted to the Council. Housed at the Lister Institute under the care of Dr. St. John Brooks the collection has grown apace, and a perusal of the fourth edition of the catalogue,[1] which has just appeared, shows no slackening in this direction. Not only is there an increase in the number of cultures actually maintained in the collection, but by agreements with certain scientific institutes some new and important groups of micro-organisms not conserved in the collection have been made available and are listed in the catalogue. In this way the National

[1] *Catalogue of the National Collection of Type Cultures*. Medical Research Council, Special Report Series, No. 214. 1936.

Collection is able to offer to research workers many of the filterable viruses affecting animals and plants; the Lister Institute, the National Institute for Medical Research, the Laboratories of the Ministry of Agriculture at Weybridge, and the Rothamsted Experimental Station having undertaken to co-operate in this service. In the same way the collection of lignicolous fungi maintained at the Forest Products Research Laboratory, Princes Risborough, is placed at the disposition of those interested in this branch of mycology. As to nomenclature, the curator has followed the recommendations of the committee appointed by the International Society of Microbiology to pronounce on this matter, but wherever necessary synonyms are included. Both in the preface and in a special note attention is drawn to the necessity for the co-operation of microbiologists if the usefulness of the National Collection is to be maintained. Not only is it essential that newly described species should be sent to the curator, but he would also be grateful for fresh examples of those already maintained in this laboratory. It is hoped that this request will not go unheeded.

TREATMENT IN GENERAL PRACTICE

We publish this week the concluding article in the series which has been appearing in the *Journal* under the above heading since December, 1934. The first group of articles—on diseases of the respiratory system, acute infectious fevers, and cardiovascular affections—has already been published in book form by H. K. Lewis and Co. The second group of articles, which have been printed weekly in the *Journal* since September, 1935, ends with this issue, and will shortly be reprinted in book form by H. K. Lewis and Co. The following subjects have been dealt with: diseases of the nervous system, of the digestive system, of the blood-forming organs; rheumatic disorders and disorders of metabolism; and renal diseases. The two volumes, it is hoped, will afford the reader a comprehensive survey of the treatment of the major medical disorders met with in general practice. It is proposed soon to publish a series of articles on endocrinology, dealing with both the scientific and the clinical aspects of this important branch of medicine.

STONE IN THE PANCREAS

Two different types of calculi are found in the pancreas—true stones in the ducts, and false stones which are really calcified areas in the parenchyma following old pancreatitis. Some idea of the rarity of pancreatic calculi may be gathered from the fact that there are only twenty-five cases of this condition in the records of the Mayo Clinic, and J. G. Mayo[1] states that the total number of cases reported from all sources is only about 125; the condition was diagnosed correctly in less than ten of these. The chief clinical feature is upper abdominal pain either side of the mid-line. It has been suggested that it is due to associated pancreatitis and that its site is dependent upon that part of the pancreas which is chiefly affected; not infrequently diabetes is present. The condition must be distinguished from cholecystitis; here *x*-ray examination is of value because pancreatic calculi, consisting as they do chiefly of calcium salts, may show up well. Of nine cases in which pancreatic lithiasis was studied at necropsy disease of the biliary tract was present in eight. Dr. Mayo believes, therefore, that when a diagnosis is made laparotomy should be performed not only because untreated pancreatic lithiasis usually leads to repeated attacks of pancreatitis, but also in order to deal with disease in the biliary tract, which he regards as the aetiologic factor in most cases. It is of interest to recall that among the early operations for the removal of pancreatic calculi in this country are those of Pearce Gould (*Trans. Clin. Soc.*, London, 1889), Moynihan (*Lancet*, 1902), Mayo-Robson (*Lancet*, 1904), and John Murray (*Proc. Roy. Soc. Med.*, 1912).

[1] *Proc. Staff Meetings Mayo Clinic*, 1936, xi, 456.

COMATOSE FORM OF TOXIC GOITRE

Dr. Hermann Zondek, who, like his brother Bernhard, the describer with Aschheim of the test for pregnancy, is so well known for his work on the endocrine organs, was professor extraordinarius of medicine in the University of Berlin until 1933, then for a short time honorary physician to the Victoria Memorial Jewish Hospital, Manchester, and since 1935 director of the medical division of the Bikur Cholim Hospital, Jerusalem. In 1930 he described "coma basedowicum" or the comatose form of toxic goitre,[1] and reproduced the account in the third edition of his monograph.[2] Now in the fourth number of the new journal *Europe Médicale*[3] he gives his experience based on fifteen cases, three of which survived. It results from slight infections in atypical but hypertoxic cases, and appears to be more frequent in Jerusalem, and especially in European patients recently arriving there, than in Germany, where he saw three cases only. The initial symptoms are those of slight bulbar paresis, but these rapidly advance so as to resemble those of myasthenia gravis; the lower jaw falls and the mouth opens, as is well shown in one of the illustrations. The weakness is so extreme that the head cannot be held up; ptosis, unilateral or bilateral, and an extensor plantar response may also be present. Later, unconsciousness and a condition like catalepsy supervene. Death is often due to pulmonary complications. Blood cultures are negative, the blood sugar, alkaline reserve, calcium, potassium, and magnesium content are normal. The examination of the thyroid and the central nervous system did not reveal any changes to explain the syndrome. The treatment recommended includes copious injections of 25 per cent. solution of glucose, intramuscular injections of prolan and of cortigen (Richter), a preparation of the adrenal cortex. Cases have been previously described as severe crises and as thyrotoxic encephalopathy.

The King has, on the recommendation of the Secretary of State for Scotland, appointed John William McNee, D.S.O., D.Sc., M.D., Ch.B., F.R.C.P., to be Regius Professor of Practice of Medicine in the University of Glasgow, in the place of Professor T. K. Monro, who has resigned.

[1] Zondek, H.: *Klin. Woch.*, 1930, ix, 1999.
[2] Idem: *Diseases of the Endocrine Glands*, London, 1935, p. 151.
[3] Idem: *L'Europe Médicale*, Paris, 1936, No. 4, Juin-Juillet.

REPORT ON THE FRACTURE CLINIC OF THE KENT AND SUSSEX HOSPITAL

BY

W. HARVEY GERVIS, F.R.C.S.

SURGEON, KENT AND SUSSEX HOSPITAL, TUNBRIDGE WELLS

In February, 1935, the B.M.A. published the Report of the Committee on Fractures. Suggestions were made therein for running in a hospital an ideal fracture clinic and fracture service generally. Following that the Kent and Sussex Hospital Clinic was reorganized, and I give below the results obtained in the first year of working.

Hospitals vary in size and to some extent in methods. What is possible in one is not possible in another. In this hospital there are 208 beds, and extreme specialization is not possible. There are many provincial hospitals of similar size, and an account of the organization of our clinic may be of interest to them. It has worked very smoothly.

Organization

The clinic is an out-patient clinic; cases requiring admission come in under the "surgeon of the week." Those cases coming to me during my own "take-in" week have received after-treatment in the clinic. All fracture cases are seen and treated in the first instance by whoever is on duty in casualty. Usually it is the casualty officer, but it may be one of the house-surgeons. The cases are then referred to the fracture clinic, which is held on one afternoon a week. The new cases and their *x*-ray films are there seen by me, and data are entered in a register which I had arranged as follows.

Date	Name	Address	Age	Fracture and Position

On the page opposite—

Date of Fracture	Position After Reduction	Remarks	Result		Date of Discharge
			Anatomical	Functional	

The patient's card is then initialled by me opposite the date of that attendance. This procedure has the double advantage that it makes certain that all cases have been seen by me and, whether for discharge or for any other matter, it makes reference to that patient easy, since it is only necessary to turn up the register at the date when the card was initialled.

The casualty officer is present at the clinic and sees the old cases. I can therefore discuss with him any case that has not been properly reduced, or in which the fixation is unsound or inadequate, or he can discuss any case of difficulty with me. All cases are referred to me for discharge, and I enter the result.

Thus the casualty officer has charge of the case from start to finish, and from his point of view the system is satisfactory. If he has been unsuccessful in his reduction or fixation he can learn where he was wrong and obtain by the end of his time a sound working knowledge of the treatment of fractures.

When I started the register I wrote up the results simply as percentages, but it was not found wholly satisfactory, since it is difficult to assess cases fairly. Now I add a note to anything under 100 per cent. stating what is wrong. The anatomical results are assessed by eye and ruler. This method is more instructive than simply repeating the *x*-ray findings after reduction. It shows, for example, what degree of angulation in, say, a radius and ulna is compatible with a perfect result; also that in some, especially Colles fractures in which the *x*-ray suggests a perfect reduction, a very slight degree of deformity can be detected by ruler after union.

Analysis of Cases

Below are tabulated the results of the 268 cases treated over a period of one year. The times represent from the date of fracture to date of discharge; only those who were seen by me for discharge are included.

Table of Results

Type of Fracture	Total Number	Completed Treatment	Average Time	Shortest Time	Longest Time
			Weeks	Weeks	Weeks
Metacarpus and phalanges	20	12	5.3	3	10
Carpus	4	4	37	16	50
Colles	46	41	5.1	3	14
Lower epiphysis of radius	12	9	5.1	3.5	8
Styloid radius	10	7	5.6	4	11
Compression greenstick lower end radius	7	5	3.7	3	5
Shafts radius and ulna	38	34	7.7	4	17
Head and neck of radius	6	6	5.6	3	8
Olecranon	5	4	6.2	3	8
Coronoid process of ulna	1	1	6	—	—
Lower end humerus	20	19	6.25	3.5	13
Shaft humerus	1	1	7	—	—
Upper end humerus	6	4	8.6	4.5	14
Clavicle	15	13	5.8	3	20
Phalanges of foot	6	5	5.2	4	6.5
Metatarsus	5	3	7.3	6	10
Tarsus	9	8	24.5	8	45
External malleolus	14	13	7	4	11
Internal malleolus	3	2	5.3	4	6.5
Pott's fracture	9	7	13	7	17
Shaft of fibula	4	4	7.3	4	12
Tibia and fibula	14	10	13	6.5	25
Fractures about knee-joint	9	8	17.5	6	40
Mandible	1	1	3.5	—	—
Ribs	2	0	—	—	—
Body of vertebra	1	1	16	—	—

Comments on Individual Fractures

Metacarpus and Phalanges.—The results appear better in the above tables than they actually were. For one thing several bad cases failed to complete treatment. For another, on going into the full details of those that were discharged, in only one-third are the anatomical results perfect, and in only one-half are the functional results perfect. The rest vary from 80 to 90 per cent.

Carpus.—These hardly form a fair series, because in all the *x*-ray films there was evidence that the fracture was not of recent origin, although from the patients' point of view the injury was recent and there was no definite previous history of injury. There were three fractured scaphoids and one fractured semilunar. Two of the former appeared to unite after prolonged fixation in a plaster cock-up, but it is too early yet to speak of the ultimate result. In the case of the semilunar and the third scaphoid I excised part of the fractured bone as they showed no improvement with fixation. The results are satisfactory so far.

Colles Fractures.—All cases were treated with the dorsal plaster slab. The majority were reduced under gas, a few with a local anaesthetic. I did many of the second reductions for cases that had not been properly reduced under a local, as then one could say that one merely had to make a slight adjustment, thus avoiding the idea in the patient's mind that the fracture had not been properly "set." Once I did one of these using a Thomas wrench without the patient objecting. All the Colles patients were told to go home and use their fingers. The majority did; one or two girls assisting in shops continued their work the whole time. Some patients would not move their fingers, and this delayed their recovery, until I learnt fully Böhler's after-treatment, which has not been sufficiently stressed in this country. At the Accident Hospital in Vienna there is a form of pulley apparatus in nearly every ward and in the out-patient department, and patients were continually made to work every joint that was not immobilized. On my return I therefore made it a rule that all patients who did not use their fingers from the start should go to the massage department in their plasters and be taught to work a pulley apparatus and do finger exercises. Of the forty-six fractures only five occurred in men. Of the forty-one cases I discharged, thirteen were 100 per cent. anatomical and functional, eighteen were less than 100 per cent. in one or both, but not less than 90 per cent. By that I mean anatomically one could detect deformity with a ruler, though it might not be noticeable on looking at the wrist. Functionally there might be some limitation of movement or pain. The majority of these in another month would have been functionally perfect. The ages of the ten less good results ranged from 60 to 81, with two exceptions. Both the latter had apparently perfect reductions, but some degree of deformity recurred.

Lower Epiphysis of Radius.—I classified these separately and was interested to find that the average time was identical with the Colles fractures. The results were all very good.

Styloid of Radius.—Except for one case, which was complicated by a fracture of two metacarpals, the average time would have been 4.7 weeks. One patient was at work in his plaster all the time. Results all 100 per cent.

Compression Greenstick Fracture of Lower End of Radius.—By this I mean the common incomplete fracture in the lower end of the shaft of the radius occurring in children, in which there is no deformity, or at most one degree of angulation, but a transverse ridge shows in the *x*-ray all round the bone in that situation. Results all 100 per cent.

Shafts of Radius and Ulna.—All but seven of these occurred in children. In twenty-nine both bones were broken. All were treated with the Böhler type of plaster from the middle of the upper arm to below the wrist, and all used their fingers from the start. One adult managed to work in the hop-fields in her plaster.

There were only two open operations: one for a radius three weeks old in an adult, which was merely reduced and put in plaster; the other for a fractured radius and ulna in a girl of 15 in which the fracture of the ulna was compound, with the end of the shaft projecting from the wound. The projecting portion was cut off, the wound excised, and the whole completely enclosed in plaster. She was discharged at the end of eight weeks with a 100 per cent. anatomical and functional result.

Nearly all the results were very good both anatomically and functionally. In one-third of the cases there was slight limitation of pronation or supination on discharge. I followed up several at a later date, and all had or were getting full range of movement. There is one point in the application of these plasters worthy of mention—namely, the ease of causing obstruction to the circulation by an edge of bandage crossing the fold of the elbow anteriorly when fixing the posterior slab.

Head and Neck of Radius.—There was no marked displacement in any of these cases. They were treated in a collar-and-cuff sling in full flexion. Results perfect.

Olecranon.—Except for one case, which I had wired, these were all minor cracks with no displacement. Three of them were still five degrees short of full extension on discharge; the others had full range.

Lower End of Humerus.—All these occurred in children except one case—namely, an external epicondyle complicating a dislocated elbow in an adult. They were all treated by a collar-and-cuff sling in full flexion. A plaster may have the advantage in an adult that the shoulder and fingers can be moved all the time, but in a child this is less important; moreover, in a child a plaster is comparatively large and heavy. All the results were functionally good, the majority perfect, although anatomically three of the results were bad.

Clavicle.—Treated by the three-handkerchief method. Results anatomically bad, functionally good.

Metatarsus.—All treated in walking plasters; results good.

Tarsus.—Tabulating these together in one average is perhaps misleading, as can be seen from the details below.

Two cases of fractured cuboid, each	8 weeks	Results good
Os calcis in child aged 9	9 "	
Posterior tuberosity of astragalus	10 "	
Two cases of os calcis in adults, each (All the above with no displacement)	35 "	Still a little pain
A navicular slightly crushed	45 "	
One case with right and left os calcis fractured with displacement	46 "	

The last was admitted and displacement reduced, and later walked in two walking plasters. Anatomical result good, but still complained of some pain when discharged to light work.

External Malleolus.—I subdivide these fractures into those below, those through, and those just above the interosseous ligament. There were six infraligamentous, average time 5.6 weeks; six interligamentous, average time 9 weeks; one supraligamentous, average time six weeks. All were treated in walking plasters; results perfect.

Pott's Fracture.—I only use this term for a fracture-dislocation of the ankle. Two of the cases had no displacement when *x*-rayed, but must have had at the time of fracture, as, for example, "fracture of both malleoli and posterior articular surface of tibia." All but one in this series were treated as out-patients, so they do not represent the worst type of case with a lot of displacement and effusion. Results: all but one—namely, a posterior articular surface of tibia—were 100 per cent. anatomically; the functional result of the latter and one other were not perfect; the others were.

Tibia and Fibula.—Except for two these were all out-patient cases, so they represent the milder type of fracture in adults and those in children. The results anatomically were 100 per cent. in all but one, and functionally in all but two.

One of the latter was in a lady of 72 with an old-standing pes cavus. She said, however, that she could walk as well after as before the fracture. The other was in a boy aged 4½ with a fracture of the middle of the tibia. He was put in a walking plaster, but came up a few days later with swelling of the toes. He was admitted, with instructions that the plaster should be cut up its whole length if there was no immediate improvement. Unfortunately the plaster was only partly cut away round the foot, and some sloughing resulted. Subsequently healing was good, but the foot and toes are still stiff.

Fractures about Knee-joint.—The majority of these were simple cracks without displacement—two in the patella, five in the head of the tibia. They were all fit, with full or nearly full function in six to sixteen weeks. Two were in-patient cases; one, an external condyle of tibia, was fixed by a screw by open operation. Anatomical result perfect, functionally only 50 degrees of flexion; the other, a separated lower femoral epiphysis, is not a good result, as it has resulted in an increased genu valgum.

Lumbar Vertebra.—This was the crush fracture of the body of the vertebra treated in the ordinary hyper-extension plaster. It is perhaps worth mentioning that the patient returned to work—namely, gardening—in his plaster after two months.

TREATMENT IN GENERAL PRACTICE

This article, one of a series on renal diseases, concludes the second group of articles on Treatment in General Practice, which will shortly be published in book form by H. K. Lewis and Co., the publishers of the first volume.

TREATMENT OF CYSTITIS

BY

G. E. NELIGAN, M.C., M.B., B.Ch., F.R.C.S.

Cystitis is rarely, if ever, a disease arising *per se* in an otherwise normal bladder. It arises from many sources, both within and without the genito-urinary tract, the cystitis being entirely a secondary manifestation of the causative disease. Therefore it is quite useless to try to treat the cystitis until the cause has been removed or treated. The first essential is to make a correct diagnosis, so let us consider the various causes and their treatment.

I.—Causes Arising within the Bladder

(*a*) *Calculi.*—Calculi of calcium oxalate or composed of mixed urates cause cystitis by mechanical irritation of the trigone and internal meatus, and occur in a macroscopically clear and acid urine. The symptoms clear up rapidly on the removal of the calculi. Phosphatic calculi never appear in a clear urine, but are secondary to a pre-existing cystitis and simply aggravate the symptoms already present. They appear in those cases of two-stage prostatectomy where there has been cystitis for a long time before operation and in which the urine tends to remain alkaline after operation. The treatment is to remove the stone and give bladder washes afterwards, at the same time endeavouring to make the urine acid by the administration of drugs. Phosphatic calculi also form round foreign bodies, and are most usually found in women, having been introduced as a rule in an attempt at abortion. Phosphaturia produces symptoms of cystitis, commonly in patients who are worried. It disappears with the removal of the nervous cause.

(*b*) *Injuries.*—A ruptured bladder following a fractured pelvis becomes inflamed, but the cystitis usually clears up rapidly after the bladder has healed and is emptying itself naturally.

(*c*) *Diverticulum.*—A diverticulum does not as a rule cause cystitis, but will keep up a cystitis due to an obstruction, such as an enlarged prostate, because it fails to empty, and the cystitis will never disappear until the diverticulum is removed. But if this is inadvisable owing to the patient's general condition the cystitis may be relieved by bladder washes of 1 in 4,000 oxycyanide of mercury and by making the patient get into the "knee-elbow" position morning and evening to ensure that the diverticulum empties at these times.

(*d*) *Neoplasms.*—A carcinoma of the bladder always causes cystitis once it has ulcerated, and papilloma may cause cystitis if situated round the internal meatus and giving rise to obstruction. As a rule there is a history of painless haematuria before the symptom of cystitis supervenes.

II.—Obstructive Causes

In obstructive cases the bladder hypertrophies and then gradually dilates; it loses its tone and fails to contract completely so that there is residual urine, and sooner or later infection develops.

(*a*) *Enlarged Prostate and Urethral Stricture.*—Cystitis due to obstruction is most often seen in men suffering from an enlargement of the prostate or an untreated urethral stricture. The condition will never resolve until the obstructive cause is removed. Suprapubic drainage and bladder washes help to improve the state of the bladder and enable the obstructing cause to be removed. In some long-standing cases the cystitis persists after operation, and then it can be cured or improved by bladder washes.

In cases of acute prostatitis—commonly due to the gonococcus or *B. coli*—the cystitis is partly inflammatory and partly obstructive. The patient should be given 1-drachm doses of potassium citrate two-hourly until the urine is alkaline, and then sufficiently often to keep it so for a fortnight after the symptoms have subsided. If such a cystitis becomes chronic the treatment will be by bladder washes and prostatic massage.

(*b*) *Vesical Calculus and Post-operative Causes.*—When acute retention due to a calculus impacted in the urethra or to a retroverted gravid uterus is relieved by removing the calculus or anteverting the uterus cystitis may follow if the patient has had to wait a long time for relief and the bladder has become overdistended; it rapidly disappears after the bladder has recovered its tone. The same applies in cases of post-operative retention. After operations such as excision of the rectum or total hysterectomy cystitis often follows. Some surgeons recommend tying in a catheter and giving bladder washes after the operation to prevent this.

(*c*) *Cystocele.*—A frequent cause of cystitis in women is the presence of a cystocele. The patient fails to empty the bladder completely and cystitis results. These cases may be temporarily assisted by bladder washes and the exhibition of urinary antiseptics, but will relapse unless the cystocele is treated.

III.—Renal Causes

In pyelitis there is always a secondary cystitis; in fact in mild cases the only symptoms may be those of cystitis. After the renal infection is cured the cystitis may persist. (Pyelitis has been dealt with in another article in this series.) Tuberculous cystitis starts in the kidney and spreads down the ureteric lymphatics to the bladder or spreads up from the epididymis. If the primary seat of the trouble is removed then the bladder has a chance to heal. Tuberculin inoculations and artificial sunlight baths will help in the cure, but bladder washes usually increase the dysuria.

IV.—Causes from Adjacent Organs

Carcinoma of the rectum or cervix may invade the bladder and cause cystitis—a sign that the case is inoperable. Diverticulitis of the colon may become adherent to the bladder and finally form a fistula. This causes severe cystitis, marked by the passage of faeces and flatus in the urine. The only treatment is a colostomy; then the cystitis, as a rule, clears up rapidly.

V.—Central Nervous Lesions

(*a*) *Tabes Dorsalis.*—In tabes cystitis occurs when the bladder becomes atonic and fails to empty. The treatment is by permanent suprapubic drainage and bladder washes through the suprapubic tube.

(b) *Fractured Spine.*—In cases of fracture of the spine with resultant retention the aim is to acquire an automatic bladder. A catheter should be tied in directly after the accident and a new one inserted every third day. Bladder washes twice a day should be carried out, and after three to six weeks the bladder may recover, as shown by its resisting on giving the bladder wash. The catheter can then be removed, and in successful cases the bladder empties itself as soon as it is filled to a certain capacity.

(c) *Paraplegia.*—In cases of paraplegia it is best to tie in a catheter so as to let the bladder drain all the time. Bladder washes should be given morning and evening. The catheter should be changed every third day. For females a small Malecot self-retaining catheter is best, as it is easy to pass through the urethra on the end of a probe and it is easily retained in position.

Drugs and Catheters

Of the many drugs in use potassium citrate in 1-drachm doses is the best in acute cases, acid sodium phosphate, 30 grains, with hexamine, 10 grains, three times a day in the chronic cases. Patients with dysuria are often relieved by saw palmetto elixir with ol. santali (Parke Davis), 1 drachm three times a day. Some patients are benefited by drugs such as pyridium or neotropin. The treatment of *B. coli* pyelocystitis is given in detail in an article on that subject in the *British Medical Journal* of September 19th (p. 599).

It is best that the practitioner should employ the type of catheter that he is in the habit of using. In the case of a female the glass catheter with four inches of rubber tubing attached to the end of it is very useful for giving bladder washes. In a male, if the rubber catheter cannot be passed, the Marshall, Coudé, or bi-Coudé catheters are best, and it is advisable to use a fairly large one, such as a No. 10, as fine ones may give rise to false passages. All the modern gum-elastic catheters may be sterilized by boiling for two minutes and then placing into cold sterile water or a weak antiseptic solution. There is practically never any need to use silver catheters nowadays, and in unskilled hands they are a danger.

The catheter should be passed with a strict ritual. First the glans penis (or the vulva) should be cleaned with a wet swab and the urethra irrigated with half a pint of the solution to be used for the bladder wash. After thoroughly cleansing the hands lubricate the catheter with a sterile lubricant such as lubafax or sterile olive oil, then pass the catheter slowly and very gently. If the patient has a spasm of the sphincter and will not allow the catheter to pass fill up the anterior urethra with 5 per cent. novocain, then hold the solution in the urethra for five minutes.

If the catheter is to be retained in position a simple method is to pass a small safety-pin through the catheter near the meatus, attach a piece of tape to either end of the pin, and then fix the tapes to each side of the penis by a piece of strapping wound round the penis below the glans.

Bladder Washes

The best bladder washes are 1 in 4,000 oxycyanide of mercury, 1 in 10,000 silver nitrate, or 1 in 2,000 potassium permanganate. Some bladders are very irritable and will not tolerate these antiseptics; in such cases a half-saturated solution of boric acid may be used.

Bladder washes should be made up to a temperature of 110° F.; this cools down considerably on passing through the tube of the irrigator. Hang a douche can, holding two pints of the solution, three feet above the level of the recumbent patient, then place the nozzle in the end of the catheter and let three or four ounces run into the bladder, withdraw the nozzle and let the bladder empty. Repeat the process until the two pints have been used. In some patients it is possible, by Janet's method, to wash out the bladder without passing a catheter, but this is not easy unless the practitioner is used to the method.

Bladder washes should, when possible, be given every day. Chronic cases of cystitis may be cleared up by putting half an ounce of 10 per cent. collargol once a week into the empty bladder.

In conclusion, it may once more be emphasized that the important point is the diagnosis of the cause of the cystitis, as until this is removed there is little prospect of cure.

MEDICAL DEFENCE UNION

THE ANNUAL REPORT

The report of the council of the Medical Defence Union presented at the annual meeting on September 24th reveals increasing membership and financial assets, and if the number of cases dealt with is rather less than during the previous year there are some of outstanding importance. The net increase of members is 471, the total membership now standing at over 19,000, and the available funds at £112,566. The need for medical defence is not restricted to medical men in private practice. Steps have recently been taken to draw the attention of all practitioners engaged in hospital work, both at voluntary and municipal institutions, to the special risks they run while unprotected and detached from the service and advice of a defence organization. Calls for advice and help for practitioners in the public health service are also increasing. With the expansion of medical services consequent upon the break-up of the Poor Law, further liabilities must be expected such as can only properly be borne by a defence organization. The view has been expressed from the bench of the High Court in two recent actions that local authorities are not responsible for the negligence of their medical officers in a professional capacity, a point which occupants of those positions would do well to bear in mind.

The report contains a summary of typical cases. These concern disputed accounts with allegations of negligence, alteration of certificates, mishaps at operation, mutual charges of negligence by members, and many other matters showing how wide and varied a field is covered. Often the first intimation of a charge of negligence is given after the doctor has sent in his account, obviously in the hope that the account will be reduced or withdrawn. In some cases the complaint is persisted in until the very last moment in the belief that the doctor will make some compromise owing to fear of the publicity entailed if the case goes to court. This fear of the results of publicity is, however, in the Union's experience, exaggerated. Patients as a whole have a sense of fairness towards their doctors, and an unjustifiable allegation of negligence tends to bring out their loyalty.

A Singular Case

An interesting section of the report is contributed by the solicitors to the Union (Messrs. Hempson), who take occasion to acknowledge the loyalty of medical men to their profession in times of trouble and difficulty. "If a medical man is in real trouble we have never experienced the slightest difficulty in obtaining assistance from every rank of the profession without thought of reward or even of compensation for the work involved and the loss of time entailed." Among the cases settled out of court during the year was one which was singular, if not unique. Many years ago in the course of an intramuscular injection the needle was broken in the patient's thigh. No immediate operation for removal was performed and no discomfort was experienced. Recently, however, the patient felt a certain pain in the thigh, and consulted a doctor and informed him of the broken

needle. A radiograph was taken, but the radiographer omitted to mark the right and left side of the radiograph. The needle, however, was clearly shown, and the doctor, not unnaturally, concluded that it was on the side where pain was felt. An operation was performed on that side, no needle was found, but a condition of the sciatic nerve was discovered which accounted for the discomfort. A further radiograph showed that the operation had been performed on the wrong side, and that the pain was in no way associated with the needle. The case was settled by a nominal payment made on behalf of the surgeon and the radiologist.

Some Figures for the Last Fifteen Years

During the last fifteen years the cases which have passed through the hands of the solicitors to the Union have included 117 libel or slander actions prosecuted or defended, 712 malpraxis actions defended, ninety prosecutions of unqualified persons, and 683 arbitrations and personal matters. Out-of-pocket expenses for counsel's fees and incidentals in connexion with litigation during the same fifteen years have totalled to over £24,000, and the average cost to the Union of the defence of its members in sixty-seven of the heaviest cases occurring during the same period works out at £521 per case.

The report mentions the losses sustained by the death during the year of Sir Charles and Sir Hamilton Ballance, the first a past president and the other a member of the council, and the resignation of Dr. W. S. A. Griffith, who occupied the presidential chair from 1897 to 1901 and again from 1931 to 1933. The president of the Union is now Mr. E. L. Pearce Gould.

Scotland

Remedying Scotland's Ill-health

With reference to Professor Lelean's address at the annual Congress of the Royal Sanitary Association of Scotland, of which an abstract was published in these columns last week at page 605, a suggested remedy for national unfitness is supplied by Mr. Eric Linklater in the *Scotsman*. The remedies as suggested by Professor Lelean are more food and exercise, more sensible education, and more medical research. No one, as Mr. Linklater says, is likely to quarrel with at least three-fourths of this answer, but the question is how these remedies are to be attained. There is no use in waiting for the Government, overburdened with urgent problems, to tackle this problem of ill-health, underfeeding, and puny children, but it would be possible to mobilize private forces of benevolence and wisdom, of worth and constructive effort. Money obtained should be spent on provision of milk food and other supplementary food for the children, on the acquisition and equipment of national parks, and on free teaching and demonstration of food values and proper cooking. With regard to national parks, he says that Scotland has more waste ground than most of the countries in western Europe, and that nearly every large city could acquire, within reasonable distance of its boundaries, great areas of hill or mountain side where permanent encampments with proper canteens might provide for its young men and women a week-end and holiday resort at a minimum cost. Admittedly the purchase of such land would be expensive as it consists largely of sporting estates, but, even so, it would be a long-term and very model investment, which would undoubtedly diminish the physical degeneration at present costing £25,000,000. The demonstration and teaching of food values and cooking would be the simplest part of the remedy. Teachers possessing the requisite scientific knowledge and a proper degree of common sense could be found, and the cost of this item would tend to diminish. The suggestion is made that the organization for the control of national parks, for the provision of supplementary food for children, and for the demonstration of proper cooking might be a series of municipal units co-ordinated by some central authority.

Edinburgh City Hospital Superintendent

At a meeting of the Public Health Committee of Edinburgh Town Council on September 15th Dr. W. T. Benson, medical superintendent at the City Hospital for Infectious Diseases, tendered his resignation, to take effect as from the middle of December. Dr. Benson took the B.Sc. degree at St. Andrews in 1915, and after completing his medical course at Edinburgh graduated M.B., Ch.B., with first-class honours, in 1918. In 1920 he took the D.P.H. at Cambridge and in 1922 the Diploma in Tropical Medicine and Hygiene at the London School of Tropical Medicine. He joined the Royal College of Physicians, Edinburgh, as a Member in 1926, proceeding to the Fellowship in 1928. For a short period Dr. Benson was assistant to the late Dr. Claude Ker, who was then superintendent of the City hospital; he succeeded to the senior post on the latter's death in 1925, and has been superintendent of this hospital and lecturer on infectious diseases at Edinburgh University for eleven years.

New Professor of Medicine at Glasgow

The King has been pleased to appoint Dr. John William McNee, D.S.O., to be Regius Professor of the Practice of Medicine in the University of Glasgow in succession to Professor T. K. Monro, resigned. Professor McNee received his medical education at Glasgow, where he graduated M.B., Ch.B., with honours, in 1909, and proceeded to the degrees of M.D. in 1914 and D.Sc. in 1920. He gained numerous prizes during his course at Glasgow, and after graduation became for a time a lecturer in pathology and assistant to the Regius Professor of Medicine in Glasgow University. During the war, in the R.A.M.C., he served in France, and was chiefly engaged in pathology. At this time he did a considerable amount of work upon trench fever, gas gangrene, and war nephritis, publishing papers upon these subjects in the *British Medical Journal* from 1916 to 1919. He joined the Royal College of Physicians as a Member in 1920 and was elected a Fellow in 1925. He has been examiner in medicine in the Universities of Cambridge, St. Andrews and the National University of Ireland, and he delivered the Lettsomian Lectures to the Medical Society of London in 1931, and was Croonian lecturer to the Royal College of Physicians in 1932. Professor McNee is at present physician to University College Hospital.

England and Wales

Medical Inspection and Treatment of Unemployed Juveniles

In a circular letter and memorandum addressed to local education authorities for higher education in England and Wales the Minister of Labour outlines the arrangements which he hopes will be made for medical inspection and medical and dental treatment in junior instruction centres. It is pointed out that there are now 185 junior instruction centres and classes in England and Wales, and that the average daily attendances per week during the present year reached 29,200. The main object of the centres and classes is to maintain and improve employability during unemployment. Ordinary good health is an important factor in securing and retaining employment, and the Minister is therefore anxious that from the employment point of view adequate medical services should be provided for unemployed boys and girls attending the centres. Such medical services in the Special Areas will also go some way towards meeting one of the difficulties encountered in connexion with the Juvenile Transference Scheme, by improving the physical condition of those who are willing to be transferred but who are in need of medical treatment. The memorandum includes a statement of the provision for medical inspection which is considered to be generally suitable for the areas of heavy unemployment. As regards medical treatment, it will be open to local authorities to submit proposals for extending

the arrangements for the medical and dental treatment of children attending public elementary schools. These may provide for milk to be supplied as medical treatment for boys and girls showing symptoms of subnormal nutrition, and to be purchased at the reduced rate of 1/2d. per 1/3 pint by juveniles attending day-time centres or classes.

New Midwifery Service next July

The Minister of Health, Sir Kingsley Wood, has issued a circular and memorandum on the Midwives Act to the local authorities who will be responsible for administering the new arrangements, reminding them that, save in exceptional cases in which the Minister allows a longer period, they must submit their proposals for the new service not later than the end of January next, so that the service may come into operation not later than the end of July, 1937. The circular stresses the importance of co-operating with voluntary organizations already engaged on similar work in the authority's area. Suggestions are made as to the method of determining the number of midwives each local authority will require, and the memorandum recognizes an obvious difference between town and country in this respect. It is thought that in populous districts each whole-time midwife should generally be capable of attending seventy cases as midwife and thirty cases as maternity nurse during the year, but in sparsely populated areas the corresponding figures would be lower. The importance, wherever possible, of giving the mothers a choice of midwife is also emphasized. It is pointed out that the pay, status, and prospects of midwives who enter the new service should be similar to those of health visitors, and that their technical skill will be kept up to date by periodical attendance at courses of instruction approved by the Central Midwives Board. The memorandum also deals with the financial arrangements of the new Act and its provisions for the award of compensation both to those midwives who are compulsorily retired on account of incapacity to perform their duties efficiently and to those who elect to relinquish their practices. The circular, containing the memorandum, has been placed on sale, and can be obtained from the Stationery Office or through any bookseller, price 6d.

India

Medical Progress in Assam

Comparison of the reports issued on the working of the civil hospitals and dispensaries in Assam from 1932 to 1935 inclusive with the annual health report for the Province for 1934 shows that considerable improvement has been effected in the administration and efficiency of these institutions, and that the general health conditions in this part of India have been increasingly satisfactory. In the triennium 1932-4 the anti-syphilis campaign was continued, and leprosy surveys in 1933 resulted in an increase of the treatment centres by ninety-seven. An intensive campaign is also being directed against yaws; a large number of cases have been detected, and eradication of this condition is anticipated from the activities of the Public Health Department. Goitre is still prevalent; a survey was undertaken in 1934, and special arrangements were made for treatment with iodine. It is noted that McCarrison holds that the prevalence of goitre along a river is an indication of heavy sewage pollution, and the necessary steps to alleviate this are being taken when possible. Experiments in the treatment of drug addicts by Modino's detoxication method were made by civil surgeons, one of whom has been so convinced of the efficacy of the treatment that he has raised the question whether it would be possible to insist upon the addicts being submitted to it before opium passes are supplied to them. The Inspector-General, Colonel C. E. Palmer, I.M.S., considers that this treatment is well worth trying in all cases when the patient professes anxiety to be cured. The Indian Red Cross Society had a remarkable record of progress during the period under review. A child welfare centre and maternity home has been established at Nowgong; the Shillong Hospital for women and children has been completed; and a training centre has been opened at Silchar to enable women to earn an independent livelihood by practising midwifery, nursing, and such handicrafts as weaving and sewing. Substantial grants have been made to the Public Health Department to extend the campaigns against leprosy and tuberculosis, and ambulance and first-aid classes have been held at widely distributed centres. The nucleus of a Provincial nursing service was established in 1931, and good progress has been made. Colonel Palmer remarks that the introduction of the nursing system has made the hospitals more attractive, and the wards are now fully occupied. Bacteriophage continues to be used as a prophylactic against cholera, and the epidemic in 1933 at Cachar and Sylhet was overcome most effectively by the mobilization of all available medical forces. It is pointed out that the success of bacteriophage is most marked in districts where it has not been previously tried, and that its efficiency both in prophylaxis and in treatment seems to weaken subsequently. It is suggested that there is some evidence that cholera vibrios possess the power of gradually becoming immune to this treatment without losing their ability to infect human beings. The infant mortality rate for Assam in 1934 compared very favourably with that of other Provinces. Colonel T. D. Murison, I.M.S., Director of Public Health, states that the heavy mortality is due in very large measure to immaturity of the infants and ignorance of the mothers; feeding is still very unsatisfactory, and there is much exposure to the evil effects of unsanitary surroundings.

Medical Training in Burma

The annual report on the working of the Burma Government Medical School at Rangoon for the twelve months ended March 31st last refers to the difficulty of calculating the cost incurred by the Government in respect of the training of each student. The Director-General of the Indian Medical Service has issued certain instructions with regard to the method of calculating this cost, based on the supposition that the medical school and college and its associated hospital are staffed independently, as is the case generally in India. In Burma, however, a complicating factor is introduced, many of the members of the staff of the medical school being employed also in the college and hospital. Furthermore, the Rangoon General Hospital serves as a practical teaching institution for both the college and the school, and some members of the staff of the school are performing duties outside it, as well as outside the hospital and college. It is therefore impossible in Burma to assess or calculate the cost per student of the school to any appreciable degree of accuracy. The hostel for male students continues to be accommodated in the old and dilapidated Rangoon Hospital buildings; the necessity for new hostels which will provide lodging for both sexes is fully recognized by the Government of Bengal, and negotiations are in progress to acquire a suitable site for their erection. Accommodation for women students is urgently required, and it is hoped that some practical decision will soon be reached on this matter. There were 145 students on the rolls at the beginning of the twelve months under review, including 108 who had joined in previous years; the men numbered 117 and the women 28, while the percentage of Burmese students was 49. The question of raising the standard of medical education is being considered by the local authorities. The income of the school increased by reason of a relative decrease in the number of students who were stipend holders. The students receive their hospital training and clinical education in the General Hospital, Rangoon, which has 540 sanctioned beds; for practical midwifery they attended the Dufferin Hospital, as in previous years, where there are 204 beds. The number of confinements has been steadily increasing, and in 1935 rose to 3,732. The length of the medical curriculum is four years, and the diploma of Licensed Medical Practitioner (L.M.P.) is awarded to those who pass the final examination.

CORRESPONDENCE

Milk-borne Epidemics

SIR,—Regarding your reference to the recent outbreak of typhoid fever at Bournemouth (*Journal*, September 12th, p. 545) and your general observations on milk-borne disease, we feel it might also be opportune to mention the scarlet fever epidemic in Chelmsford during August–September, 1935.

During this outbreak 666 cases were notified as of scarlet fever in the borough and rural districts of Chelmsford, and six deaths occurred. Moreover, it was estimated that the total number of persons affected exceeded 1,000, as the disease showed varying manifestations, and only those cases presenting the signs and symptoms of so-called scarlet fever were notified. The source of the infection was traced to a milker at the farm producing the bulk of the milk, and ample proof of this was obtained through swab cultures and serological typing.

It seems strange in these days of enlightenment that raw milk, such an excellent medium and vehicle for the spread of disease, should still be regarded as safe for human consumption. As was shown in the Chelmsford outbreak, an infectious milker in contact with the milk for only a comparatively few hours was the source of widespread disease throughout the area lasting many weeks. Besides the individual physical suffering, the cost to the community in loss of wages and to the local authorities in dealing with the outbreak may well be imagined.—We are, etc.,

J. L. MILLER WOOD.
F. E. CAMPS.

Chelmsford, Sept. 16th.

Tuberculous Cervical Glands

SIR,—Dr. Thompson's article on the treatment of tuberculosis of cervical glands is very timely. There is no justification for their surgical removal. But Dr. Thompson has omitted to mention the excellent cosmetic results obtained in tuberculous cervical adenitis from small repeated doses of *x* rays. This may be advantageously combined with artificial sunlight. In this connexion I should also like to mention the possibility of improving the very unsightly scars which follow surgical operation or spontaneous ulceration by means of deep *x* rays or superficial radium applications.—I am, etc.,

London, W.1, Sept. 18th. A. ORLEY.

SIR,—I was very interested to read Dr. Brian Thompson's article in your issue of September 19th (p. 584) and his criticism of the results of surgery in cases of cervical gland tuberculosis. My experience of these cases supports his conclusions that recurrences after surgery are frequent, and excision of tuberculous glands no longer appears to be a justifiable procedure. The cosmetic results after surgical intervention are often appallingly bad, and it is no uncommon sight to see patients with large, ugly, keloidal scars on one or both sides of their necks.

For several years I have treated cases of tuberculous glands of the neck and other parts of the body by means of radium, and have found the results to be almost uniformly good as regards both the disappearance or diminution in size of the glands and the cosmetic effects. It is true that there are occasional failures and recurrences, but even these usually respond to further irradiation and heal eventually with better scars than are obtainable after surgery, and I think that Dr. Thompson would obtain even better results than he is getting were he to try radium or *x* rays in addition to the conservative methods he now advocates.—I am, etc.,

London, W.1, Sept. 18th. F. G. NICHOLAS.

Hexamine in the Treatment of Pyelitis

SIR,—I read with great interest the article on the treatment of pyelitis by Dr. J. Norman Cruickshank in last week's *Journal* (page 599). There is one point, however, which calls for comment, and that is the use of hexamine with an acid mixture, on the assumption that formaldehyde will thus be liberated in the urine. First, if the hexamine is taken with an acid or a neutral mixture surely it will be broken down in the stomach! Secondly, if hexamine only exerts its antiseptic action in an acid medium, how comes it to be used (apparently with success) as a biliary antiseptic, and as a disinfectant of the cerebro-spinal fluid in meningitis?

With these points in mind, it is my practice to prescribe hexamine in tablet form to be taken immediately after a large dose (30 grains) of pot. cit., and I have found that this treatment is far superior to the use of hexamine with an acid mixture, or to the use of an alkaline alone.—I am, etc.,

M. H. ARMSTRONG DAVISON, M.D.

Newcastle-upon-Tyne, Sept. 21st.

Blood Replacement after Haemorrhage

SIR,—Dr. W. W. Walther (*Journal*, September 19th, p. 607), in his letter referring to my article in the issue of September 12th (p. 537), suggests that detoxicated blood plasma from a universal recipient would be superior to ephedrine-glucose-gum solution for intravenous infusion in the post-haemorrhagic state.

May I say that I do not consider that in ephedrine-glucose-gum solution I have found an ideal substitute for blood, but that it has proved the most satisfactory preparation I have tried so far in this type of case. The formula was evolved from those of the available solutions after a number of modifications during a period of several years, and it is possible that the next step forward will be taken when a natural and physiological colloidal suspension of the type suggested by your correspondent is made available for general use.

For the present, and probably for some time to come, it appears that the restricted source and the heavy cost will render the method he suggests impracticable for general adoption, unless detoxicated animal plasma compatible with all human blood could be prepared on a commercial scale at a reasonable cost. "Blood" from the cadaver, as used by Judine and others, would, of course, be useless for this purpose, and the present tax on voluntary blood donors being heavy any additional call on their resources, unless amply justified, should be avoided so far as possible.

The alternative "natural" fluids for infusion—for example, Judine's vascular washings from the cadaver, de Frenelle's untyped blood-glucose mixture, and the erythrocyte suspension in citrate-glucose of Rous and Turner—all have disadvantages similar to those of the plasma, with the additional factor of increased difficulty of preservation.

The principle I wish to emphasize, which is appreciated by Dr. Walther, is that in a number of cases of acute exsanguination early intravenous infusion is essential, and this is only possible when a stock solution is available for immediate introduction into the vascular system.—I am, etc.,

Newcastle-upon-Tyne, Sept. 19th. WILLIAM HUNTER, M.D.

Medical Coroners

SIR,—The Departmental Committee appointed by the Home Office to inquire into Coroners Law has recommended that in future the appointments to the office of coroner should be confined to solicitors and barristers. This is but one of many ill-advised and retrogressive alterations in the existing law suggested by this committee which I hope sincerely will not be given statutory authority, for it would definitely exclude medical men from becoming coroners.

The great bulk of cases dealt with by coroners involve questions of a medical nature, and very few call for any legal knowledge at all. Among the proposals made by the committee is one to confine coroners' inquests to the discovery of the cause of death, and to exclude from the scope of the inquiry all questions of civil or criminal liability. This proposal, therefore, will render the possession of legal training by the coroner even less desirable than it is at present, and will tend to accentuate the importance and value of medical knowledge in the holder of the office. As a matter of fact the actual cause of death in cases of death from violence is already known before any inquest is held. In all fatal accidents in factories, building operations, and in all railway and street fatalities, and so forth, the cause of death is always simply "injuries." It seems fatuous in these circumstances to limit the functions of the coroner's jury to the discovery of what is already perfectly well known, and at the same time to deprive them of their age-old duty of deciding to whose fault, if any, the deaths were attributable.

If, however, this question of legal responsibility for fatalities is no longer to be inquired into by a coroner, why on earth should it be insisted upon that he should be a lawyer? Questions of law seldom arise at present in the coroner's court, and when they do they are of the simplest character, and can quite easily be dealt with by a medical coroner. In the future, if this recommendation be adopted, such legal matters will never occur at all. But medical questions of great complexity arise almost daily in our courts, and in my view these are best handled by medical men, who can, by virtue of their training, easily understand them, whereas a lawyer cannot. Out of 67,000 cases that came before coroners in 1934 only 140 were of murder and manslaughter, and it is chiefly in this class of case that legal questions arise. In street and other fatalities due to violence questions of negligence do arise, but these are relatively few, and, if this proposal of the committee becomes law, even these will disappear, and the jury will, as I have said, sit to decide merely the cause of death, which is already known.

Like my friend Mr. Purchase (September 12th, p. 560) I have had working practical experience for many years of the professions of both medicine and law, and while I am prepared to admit that my practice at the Bar has proved most useful to me in my work as a coroner, I must say, without any hesitation whatsoever, that I have found my medical training and education and knowledge of far greater assistance than my legal practice and experience. The ideal to strive for is a coroner with medical knowledge and also with some legal attainments.

A medical man who has read for and been called to the Bar but who has not actually practised law will be excluded from the office of coroner if this unwise proposal is carried out. In my view the rejection of such candidates for the office of coroner will be a profound mistake, and will be directly opposed to public interest and public safety.—I am, etc.,

London, W.2, Sept. 20th. S. INGLEBY ODDIE.

SIR,—When the Departmental Committee on Coroners issued its report I was permitted to offer criticism of some of its recommendations in your columns. In the *Journal* of September 12th (p. 560) I was happy to find support for my views in the letter of Mr. Purchase, who pronounces on the subject with the authority of a dual qualification.

While, however, he would stress the desirability of selecting for the position of coroners men who have had practical experience of medicine and law, it will be difficult to fulfil this requirement. Few who have been called to the Bar after being engaged in the practice of medicine are willing to renounce one vocation and adopt the other in the remote expectation of securing a coronership. He confirms my opinion that, as regards the relative importance of the "medical" qualification as opposed to the "legal," the former preponderates. Yet, where actual experience of both has not been possible to attain, the practising doctor who is a theoretical lawyer is still admirably suited for this office.

In his lucid observations on the state of conditions now obtaining in the selection of coroners he has perhaps unwittingly referred to a problem which has hitherto been ignored. Section 10 of the Coroners (Amendment) Act, 1926, among other things states: "The Coroners Act, 1892 (which relates to the appointment and powers of deputy coroners), shall apply. . . ." Reference to this Act of 1892 reveals the fact that the appointment of deputy coroners rests with the existing coroner, who, providing the choice conforms to the simple stipulation of "a fit person," can select a person irrespective of capacity or of the minimal professional standard. The sole arbiter is the chairman of a county or borough council or the mayor. This reposes undemocratic power in the hands of officials and civic dignitaries whose favour may be dictated by considerations which are more political and personal than professional.

The evil of this system lies in the fact that it is recommended that the ranks of coroners be recruited from their deputies. While there is no restriction on the free choice of a deputy by a coroner, any suggestions to better existing conditions are negatived by this circumstance.

There have been some instances of appointments of deputies to coronerships apparently made on the slender claim of this previous office, while the superior and double qualifications of other candidates have gone without recognition.—I am, etc.,

Dublin, Sept. 13th. JOHN SHIEL, L.R.C.P., L.R.C.S., Ph.C., Barrister-at-Law.

Health of African Natives

SIR,—The eloquent appeal of Sir Ernest Graham-Little on behalf of the natives in East (not South) Africa, supported by the well-known research work of Drs. Gordon and Vint, induces me to plead for another inquiry, which, to my mind, is equally important. In doing so I do not wish to minimize the importance of the work carried on in their particular field of endeavour, but I would like to lay stress on the fact that where natives are well fed and housed, with the subsequent diminution of parasitic and other diseases, their intelligence and physical fitness show a remarkable improvement, and can be favourably compared with the lower-grade manual workers, even in England, with its ancient civilization.

I plead for an inquiry into the effect of the equatorial climate on the physical and mental well-being of the European in Kenya. After twenty-one years' residence in that country, from which I have recently retired, I could quote many instances in my own practice, whose history after years of persistent struggle against adversity

has ended tragically, and could, in my opinion, be only attributed to the effects of the climate on the nervous system—effects which are insidious and progressive in their nature. After all, the natives of Africa are endowed by nature with a certain degree of protection against the deleterious influences of the sun's rays, but no such protection is inherent in the European, and when to this is added the susceptibility to diseases peculiar to a tropical climate, and the struggle for existence in a country in which by nature he is not fitted, it is not surprising that a nervous breakdown is a common occurrence.

To my mind the problem of native backwardness is more or less solved by improved hygienic measures, diet, and education, but the question of European fitness for residence in a tropical climate like East Africa goes deeper, and, I submit, is equally worthy of inquiry.—I am, etc.,

M. MACKINNON, M.D., D.P.H.

Twickenham, Middlesex, Sept. 15th.

SIR,—Will you allow me to correct the heading you have given to my letter in the *Journal* of September 12th (p. 560). My letter, as the text amply demonstrates, was concerned entirely with communities outside the Union of South Africa, which would be primarily responsible for the welfare of South African natives, and your addition of the word "South" to my title "African Natives" conveys a wrong impression, which I am anxious to avoid.—I am, etc.,

London, W.1, Sept. 15th. E. GRAHAM-LITTLE.

Anaemia and Toxaemia of Pregnancy

SIR,—The paper by Drs. Jocelyn Moore and E. M. Pillman-Williams on anaemia and toxaemia of pregnancy, which appears in the *Journal* of September 12th (p. 528), concludes with the sentence: "In other words, when the haemoglobin value is kept up in the region of 90 per cent. the incidence of toxaemia is lowered." In view of the importance of a careful and orderly approach to the difficult problem of the causation of the toxaemias of pregnancy, it appears to us to be profoundly unsatisfactory that such an emphatic statement should be published in a journal of the standing of the *British Medical Journal*, when examination of the data proves it to be entirely baseless.

Neglecting altogether to take into account the authors' curiously broad interpretation of toxaemia—which appears to include headache, nausea, vomiting, heartburn, and cramps at any stage of pregnancy—the evidence appears to be that one out of thirty-five iron-treated patients showed toxaemic symptoms, whereas six out of thirty-four patients not treated with iron showed such symptoms. As the authors provide data to the effect that of approximately 1,100 patients delivered in the institution in which they work 5.8 per cent. exhibited toxaemic symptoms, it is simple to calculate that the most probable number of toxaemic cases to be found in any group of thirty-four to thirty-five is two. It follows that the "control" group of thirty-four cases, in which six toxaemic patients were found, was quite unrepresentative of the population from which it was drawn. This is not very surprising in view of the small size of the group. On the other hand, the one toxaemic patient in the iron-treated group of thirty-five conforms much more closely to expectation, and it would obviously have been impossible, even if no toxaemic cases had occurred in this group, to draw any valid conclusions concerning the effect of iron. If the control group can deviate by four cases from expectation no significance can be attached to a deviation of two cases in the treated group. The only conclusion that can be drawn with propriety from these figures is, therefore, that the data are inadequate for the provision of any information on the relation between anaemia and toxaemia of pregnancy.

The authors of this paper also include a table in which the frequency of incidence of toxaemia in patients having different haemoglobin concentrations is shown. They make no comment on this table, but it seems to be the only possible source of the figure of 90 per cent. quoted at the beginning of this letter. The table is reproduced below.

Haemoglobin Content:	50-59%	60-69%	70-79%	80-89%	90%+	Total
Cases of toxaemia	1	3	12	9	2	27
Cases of toxaemia and chronic nephritis	1	—	—	—	1	2
Total	2	3	12	9	3	29

It means nothing unless we know what proportion of all cases would fall into each of the above groups. Fig. 1 of the paper by Fullerton (p. 523), which immediately precedes the paper which we are considering, indicates that in all probability the proportion of toxaemic cases to the total number of cases in an adequate series would be very similar in all the haemoglobin groups. But Fullerton's patients do not form adequate controls to the patients under consideration, so that here again no useful conclusion can be drawn. In other words, there is certainly no evidence here available from which one may conclude that the incidence of toxaemia is lessened when the haemoglobin is kept up in the region of 90 per cent.—We are, etc.,

MARY FISHER, M.R.C.S., L.R.C.P.,
Public Health Department, City of Oxford.
R. B. FISHER, Ph.D.,
Department of Biochemistry, University of Oxford.

September 14th.

National Maternity Service

SIR,—Dr. C. L. Somerville's solution of our midwifery problems (*Journal*, September 12th, p. 561) seems a simple one: there are certain difficulties in midwifery conducted in the patient's own home, therefore patients should go to a maternity hospital, where they will be delivered by "general practitioner specialists" (capable of doing Caesarean sections and operations for ectopic pregnancies), and it follows that the B.M.A. policy is all wrong.

But how far is this proposal based on facts or practical considerations? There will always be the doctor who cannot do any work unless he has much apparatus and many helpers, and he will naturally prefer to work where these facilities can be obtained—that is, in hospital. There will always be, we hope, the other type of doctor, who appreciates the importance of the essential parts of his technique as distinct from the outward forms and observances, and he will be found in general practice, conducting confinements with (we have it on good authority) results which are not inferior to those obtained in hospitals.

There are several reasons for his success. He has lost that childlike faith in asepsis with which we all leave our training schools, realizing that the towels and other contents of the drum are seldom sterile for long once

they are in use. (Any doctor can don a sterile gown, cap, and mask; few know how to conduct themselves afterwards so that they remain sterile.) Knowing that these things give only a false security, he uses an antiseptic technique. He has examined the patient antenatally, and has advised her on many things, including the suitability of her home for her confinement. He arranges that the nurse shall be one who knows her work: one to whom the refilling of a basin does not present difficulties. He arranges also that the patient shall have some analgesic such as hyoscine, which prevents her from becoming exhausted, reduces the amount of inhalation anaesthesia required, and so renders less likely any post-partum haemorrhage. From previous experience of such cases he has gained a certain amount of mental agility and manual dexterity, which enable him to deal with any minor difficulties that may occur.

Now has Dr. Somerville adduced any real reasons why such a doctor should not be permitted to practise his profession as he thinks fit, sending into hospital cases which are suitable for hospital confinement for reasons of finance, home conditions, or obstetrics, and attending at home those cases which, from his experience, he feels can most suitably and safely be dealt with in this way? Must he be able to do Caesarean sections and operations on ectopic pregnancies before he can be held to be a "general practitioner specialist"? If so, then at once two classes of practitioner will be created. If not (Dr. Somerville is not very clear on this point), then what difference is there from the present position, except in name?

Dr. Somerville refers several times to the "modern and future trend" for midwifery work to go to hospital. This trend certainly merits the attention of the organized profession, especially as many who have gone into the matter feel that it is not a natural trend, but largely an artificial one, depending on two main factors. One is the maternal mortality scare, exploited by health visitors, clinics, and others. The other is that the hospital offers to attend the patient for a smaller fee than the patient would pay in the ordinary way at home. The result is that perfectly healthy mothers, expecting a normal confinement, living in good homes, and well able to pay ordinary fees, are being confined in hospitals where for some obscure reason the medical staff feel that they must blandly acquiesce in a manifestly unfair price-cutting campaign.

All this is serious enough, but a still more sinister aspect of the whole question is touched on in the letter of "M.B., B.Ch." on the teaching of obstetrics (*Journal*, September 12th, p. 562). The difficulty of the student or post-graduate in obtaining sufficient instruction is seized on by many as a justification for diverting to the hospital cases in which the patients would normally elect to be attended by their own family doctor. The position may then quite well arise that the hospital which has received fees for instructing the doctor in midwifery may be taking in so many cases as to limit very considerably the opportunities of that doctor for doing maternity work among his patients.

The local health authority now takes a hand. An inquiry as to the number of cases attended by each doctor in a year can be made to produce figures to show that the average doctor gets so little midwifery work that the local authority can say he has not sufficient experience to keep up his technique, and that therefore these cases should be sent to the municipal hospital. The whole position is no credit to what is sometimes referred to as "a noble profession," and urgently requires a thorough investigation by the B.M.A.—I am, etc.,

London, Sept. 14th. A. KEITH GIBSON.

Teaching of Obstetrics

SIR,—I feel that "M.B., B.Ch." (September 12th, p. 562) is embarking on general practice with unnecessary trepidation. From earliest times the vast majority of women have delivered themselves naturally. Even in the days of magic I do not think the maternal mortality was much worse than it is to-day. The only obstetric assistance in those days was the manipulation of a large stone on the husband's abdomen.

The application of forceps is not often necessary. "Failed forceps" is generally the result of almost criminal negligence. Where the golden rules—largest diameter of head passed, smallest diameter of pelvis, os fully dilated, and bladder and rectum empty—are followed no accidents should occur. Many textbooks—for example, *The Queen Charlotte's Practice of Obstetrics*—give an excellent description of how to apply forceps. My brother showed me how to use them a few weeks after I qualified. Such dangers as placenta praevia and contracted pelvis are easy to diagnose early, and can be sent to hospital.—I am, etc.,

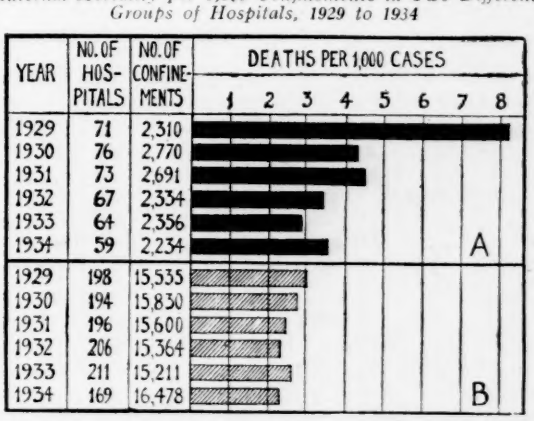
Heighington, Sept. 16th. W. G. H. ALLEN, M.D.

Prevention of Puerperal Sepsis

SIR,—Some time ago, in correspondence with Dr. Leonard Colebrook, he suggested to me that the publication of the accompanying graph, with an explanation of the action taken to reduce puerperal sepsis in hospitals admitting medical, surgical, and maternity cases, might be of interest. Dr. Dora C. Colebrook's investigation[1] into the source of infection of puerperal fever gives strong support to the belief that these hospitals are dangerous. A statement that particularly struck me was that the bacteriological findings showed "the very special risk which the parturient woman runs when her confinement is conducted in an infected environment."

The accompanying graph shows the very high maternal mortality in 1929 of seventy-one small maternity hospitals which were also licensed to admit medical and surgical patients. Though the patients were nursed in different

Maternal Mortality per 1,000 Confinements in Two Different Groups of Hospitals, 1929 to 1934



A.—Showing the maternal mortality in combined maternity and medical and surgical hospitals. Note the reduction in the maternal death rate following the exclusion, after 1929, of septic and suppurating surgical cases from those hospitals (approximately 66 per cent.) having a staff too limited to provide separate nursing for the surgical and the maternity patients. Emergency maternity cases admitted to public hospitals without maternity wards were not included, as they form a separate class.

B.—Showing the maternal mortality in hospitals admitting maternity cases only.

[1] "The Source of Infection in Puerperal Fever due to Haemolytic Streptococci." Medical Research Council, Special Report Series, No. 205. (1s. 6d.)

rooms the nursing was by the same individual, and the same sinks were used for cleaning basins and emptying bed-pans from each side of the hospital. The high maternal mortality was proved to be due to deaths from puerperal sepsis, and in 1929 was 8.29 per 1,000, as against 3.19 per 1,000 in 191 hospitals admitting only maternity patients. In 1930, after reviewing the conditions under which these hospitals were being conducted, it was found that approximately 66 per cent. of them had a nursing staff below the number necessary to provide separate nursing when septic surgical cases were admitted, and that in these hospitals the facilities were quite inadequate to ensure the avoidance of cross-infection. Consequent upon that inquiry the hospitals deficient in these particulars were licensed with a proviso that no suppurating or septic case or other case of a nature infectious to maternity patients should be admitted ; the result was startling. As the graph shows, in 1930 the death rate fell to 4.33 per 1,000. The rate has fluctuated somewhat since then, and, as shown in the graph, has always been higher than the death rate in the hospitals devoted entirely to maternity work.

These results over a large number of hospitals in the whole of a country so entirely endorse the bacteriological findings of Miss Colebrook that I feel they may be of interest in impressing upon those still unconvinced that the mixed hospital is at any rate a potential, and often an actual, danger to maternity patients.—I am, etc.,

T. L. PAGET,
Inspector of Private and Maternity Hospitals, Department of Health, New Zealand.

Wellington, New Zealand.

Maternal and Infant Mortality

SIR,—One of the fundamental principles of midwifery is the forbidding of vaginal examinations so far as possible before the birth of a child. During the past few years much has been written about maternal and infant mortality, and so far as I have been able to gather ante-partum vaginal examination has never been given as a cause of sepsis and mortality. The ante-natal centres for mothers and infants seem to make a routine of vaginal examination of the patients who come to them for ante-natal care.

I have seen women who have been examined at ante-natal centres actually bleeding from the " gentle " examinations they have undergone. Now it stands to reason that at this time the vagina and the surrounding tissues are gorged with blood, so that any injury before the child is born is liable to make a very good bedding ground for microbes. Were it possible to bring in a law forbidding vaginal examination at any time in the expectant mother we should, in my opinion, get rid of quite a nice percentage of deaths from sepsis.

Now to turn to a cause of infant mortality which a little care and thought would certainly obviate. Every week throughout the year children are taken to the child welfare centres, where the mothers are seated on forms in either draughty corridors or cold rooms. Here the children are partially undressed to await their examination and weighing by the doctor. The doctor is in a warm room with a fire and the child is completely undressed once it enters this room. Now from this warm room it is taken back into the draughty corridor or cold room to be put into its cold clothes and then taken home. Now if these centres were to treat the children for any illness or were to help the mothers in any way outside of giving advice which these unfortunate people only too often cannot afford to follow, there would possibly be expended some thought outside of mere statistics on these children. As it is, statistics seem to be what these centres are after, and the local practitioner or the parish doctor is given the worry and trouble of curing the child of pneumonia or bronchitis which so many of these children suffer from, especially in winter, after a visit to the welfare centre.

It seems that the time has come for the general practitioner to demand that these centres be turned over to him, for then the welfare of the women and children who attend would be his responsibility and not the responsibility of the five to ten office people who could not possibly think more of these unfortunates than " just another case."—I am, etc.,

London, W.9, Sept. 21st. J. HIRSCHMANN, M.A., M.B.

Mechanized Medicine

SIR,—The letter of Dr. Taylor-Thomas in the *Journal* of September 12th (p. 562) is very much to the point. National health insurance has no doubt been a great boon to the low-waged worker and a help to some doctors, but it can be, and is, subjected to much abuse. I fancy only those who have practised in other countries appreciate this point to the full.

I am convinced the majority of panel patients do not get full enough investigation. My surgery hours are cluttered up with people who certainly would not come so often or drink so much medicine if they had to pay even one penny a visit. I cannot do otherwise than rush them through. Those who are obviously ill, or who fail to regain good health after a reasonable lapse of time, are examined more carefully at home or out of surgery hours ; but this method is only a makeshift, and I remember with dissatisfaction two carcinomata of the stomach recently diagnosed too late and a latent pulmonary tuberculosis labelled neurotic.

There is another point, moreover. I am an assistant, but I possess certain special knowledge and skill which is not ordinarily required of panel practitioners. A certain common condition can be cured by the application of this skill (let us call it method " A ") ; it can also be treated palliatively by an easy method, method " B." My principal (a fine man, who would never honestly believe he was a hypocrite) says I must tell panel and parish patients of both methods, but not urge one as better than the other ; on the other hand, those that will pay extra are to be told method " A " is best. He says one cannot run a practice on business lines otherwise.

It seems to me that either all classes must get a sufficient wage to be able to pay for medical attention or else there must be a full and complete service, such as is attempted in Russia. Is not the much-quoted English principle of free choice of doctor merely the unconscious attempt of established practitioners to guard their " capital " intact? And is it not tending to perpetuate the deplorable state of mind that looks on a bottle of medicine as a charm for all ills and misdemeanours? I honestly feel that panel practice, no matter how good one's intentions, is not good public service and often not good medicine.—I am, etc.,

September 15th. JUVENIS.

Medical Education and Examinations

SIR,—The remarkably liberal-minded and convincing contribution by Dr. Wilson to the discussion on examinations for medical students in the Educational Number of the *Journal* (September 5th, p. 449) has, by a lucky coincidence, strong support in the memorandum on examinations for scholarship and special places in secondary schools recently issued by the Board of Education. It is the report of an inquiry into the value of examinations

for entrance to secondary schools. These examinations have the peculiar advantage over those for qualifying to practise medicine that the result can be assessed in a manner and degree impossible in the case of medical practitioners. The principles underlying the two examinations, however, are so closely allied that the pamphlet is worth studying by all who are interested in this vexed question. I should like to quote some of the sentences from the Board of Education's memorandum which apply equally to examinations for admission either to studentship or to practice.

"The importance of accurate selection is vital, and the main business is to get the right [children]. . . . The taking of the examination must not be looked on as the aim and end of the education given . . . and success shall not depend upon special preparation.

"No examination, in fact, can do its work properly unless all those concerned realize the evils of intensive special preparation, and co-operate in eliminating it as far as possible. . . . What is important at present is that existing examinations should be more regularly tested. . . . The success of an examination should be judged . . . by the subsequent career of the candidates examined. . . . School records are already taken into account in many special place examinations. There is reason to believe that their value would be considerably increased if they were accepted as an integral and important part of the selective machine. . . . Attempts might be made to determine what characteristics other than those revealed in examinations contribute to success . . . and how these are to be evaluated."

There is much more in this short pamphlet that might be studied with advantage, but which cannot be quoted in a letter such as this. There is a general realization, however, that in this matter we are still in the stage of experiment in method and inquiry as to the result.—I am, etc.,

Bradford-on-Avon, Sept. 15th. CHAS. E. S. FLEMMING.

Treatment of Hallux Valgus and Rigidus

SIR,—I find myself in agreement with Mr. A. B. Mitchell's letter of September 12th (*Journal* p. 559). In hallux rigidus he advises traction in the after-treatment. The fundamental importance of this needs to be emphasized. I prefer firm traction by elastic tubing, ten inches long, attached to a pin passed through the pulp of the toe and fixed to a metal hoop incorporated in a plaster casing applied to the foot and ankle. The traction is made in moderate dorsiflexion, and is maintained for ten days at least. In some cases it is beneficial to carry out gently the preliminary movements of the new joint under gas anaesthesia. The better the traction the less the amount of bone removal that will be required.

In regard to hallux valgus there is the class of case in which the first intermetatarsal space is normal. It is a strong foot, in which the great toe has gradually become curved and deflected so that it comes to lie beneath the second toe, and a bunion has developed. Might this be termed "the phalangeal form of hallux valgus"? There is no limitation of dorsiflexion. A longitudinal incision is made on the supero-internal border of the joint, curving slightly upwards. The flaps are dissected back and the bursa removed. It may be ablated in the skin incision. A V-shaped tongue of capsule and periosteum, its base attached to the proximal phalanx, is dissected off the metatarsal and retracted. The exostosis and the osteophytes are removed, and possibly a small portion of the medial aspect of the metatarsal head. The toe is then grasped firmly and manipulated into position. The base of the tongue is dissected up to the junction of the base and shaft of the proximal phalanx and a cuneiform osteotomy, its base medial, performed through the base of the phalanx, to complete the straightening of the toe. The tongue of capsule and periosteum is stitched back in moderate tension with a few interrupted plain catgut sutures, and this maintains the correction. The osteotomy heals strongly and quickly, and the procedure does not prolong the stay in hospital beyond the period usual for operation as otherwise performed. It is not always necessary to do the osteotomy, but in this class of case it often gives the final correction which seems necessary. I think that the removal of the head of the first metatarsal bone in hallux valgus should be avoided if possible. If it is done, after-care by traction, as in hallux rigidus, should minimize the possibility of painful fibrous ankylosis.

We are shooting at a different target altogether when the hallux valgus is associated with abduction of the first metatarsal bone. The first metatarsal bone is often short. Is not this a "weak" type of foot and one in which the Mayo operation may give bad results? Better understanding of the pathogenesis of this type of case is necessary before the best operation for its relief is discovered. It might be termed "the metatarsal form of hallux valgus." The procedure of making a web incision between the first and second toes, as described by Stanley and Breck (*Journal of Bone and Joint Surgery*, October, 1935, p. 961), may have much to offer in dealing with it. Mr. McMurray, in his interesting paper (*Journal*, August 1st, p. 218), describes the stretching of the transverse metatarsal ligaments so commonly associated with this type. Would it be feasible to manufacture a new set by a strip of fascia lata passed through or round the affected metatarsal bones? The web incision might be useful in attempting this. A "prophylactic" operation of this nature may come to be used in the early case of so-called hallux valgus in the "weak" foot.

Removal of the sesamoid bones for the relief of hallux valgus has been advocated in the literature, and it would be interesting to know if your correspondents have had experience of it.—I am, etc.,

W. A. COCHRANE, M.B., F.R.C.S.Ed.

Edinburgh, Sept. 16th.

Mechanical Function of the Heart

SIR,—Professor McDowall, when discussing the mechanical function of the heart at the meeting of the British Association (*Journal*, September 19th, p. 601), does not seem to have dealt in any way with its lubrication.

In 1915, during my investigations, I found that there is in the pericardial cavity of a healthy heart a negative pressure of about 6 cm. of water. My work was confirmed by Professor Halliburton. The existence of this negative pressure ensures that a suction action is produced which keeps the pericardial fluid at a fairly uniform thickness all over the surface of the heart. In other words, the heart works in a lubricating bath. Whether the person stands or lies down the heart is equally surrounded by this serous fluid. Disease, however, causes the composition of this fluid to be modified, both as to quantity and to quality, and as a result the lubrication of the heart is affected. This is especially the case when the negative pressure has been so modified that the fluid is no longer kept in constant contact with the whole surface of the heart.

The condition of the pericardial fluid is therefore a matter of the greatest consequence, and in order to deal adequately with any disease or disorder of the heart it becomes highly important for the medical practitioner to be able to form a fairly accurate idea of the contents of the pericardial cavity. But how can this be done? First, by means of radiography, because a radiograph of a healthy heart shows that there is no difference in the

shape and size of the heart whether the person is standing or lying down. In disease there is an obvious difference; the radiograph of the heart taken in the horizontal position shows that organ to be more globular than it is in the vertical position, because the fluid is not kept in close contact with the heart, but falls to the lower part of the sac under the influence of gravity. At the same time the pericardium is not kept in such close contact with the heart and does not support it as in health.

Heart tracings, as I have shown, when taken by means of Mackenzie's polygraph, are of value in demonstrating the differences of the intrapericardial conditions in health and disease. In health the heart tracing is found to be the same, whether the patient is standing or lying down, but in disease the heart tracings vary according to the position of the patient. These differences have a very practical bearing on the auscultation of the heart sounds, if one remembers that the energy which travels from the chest along the tube to the ear and gives rise to the sensation of a sound is the very same energy that travels along the tube to the polygraph and gives us a heart tracing. If, however, the heart tracing changes in heart disease as the man changes from the horizontal to the vertical position, it follows that the sounds change also, and consequently the sounds ought to be a criterion of the state of the pericardial fluid and therefore of the lubrication of the heart.—I am, etc.,

Swansea, Sept. 20th. G. ARBOUR STEPHENS.

Trained Nurses in Factories

SIR,—In the *Times* of September 11th there appeared under the heading "Staff Nurses in Factories" a letter from Sir Arthur Stanley, writing as chairman of the council of the College of Nursing, in which, referring to the employment of nurses in factories, he says "the scope of the latter's [the nurse's] work is being enlarged, and in addition to the treatment of accidents and minor injuries she is required to advise in a general educational capacity where health is concerned." In recent letters in the *Journal* (August 1st, p. 258; August 29th, p. 443) I have stressed the importance in the training of the general practitioner of the study of health and its maintenance, and I can only hope that steps will be taken to provide such instruction before the general practitioner finds himself superseded in this beneficent work of health maintenance by nurses and others medically less qualified to undertake it.—I am, etc.,

London, W.1, Sept. 16th. HAROLD H. SANGUINETTI.

Drainage of the Maxillary Sinus

SIR,—Please allow me a small space to criticize an article by Mr. Arthur Miller on "Drainage of the Maxillary Sinus" in your issue of June 27th (p. 1299).

The Caldwell-Luc operation is the only justifiable operation, in my opinion, where the maxillary sinus has to be opened. In this opinion I know Mr. Tilley and many of the Continental workers agree. What, however, is the justification for opening the sinus?

There are two common diseases which affect the sinus, catarrhal sinusitis and muco-periostitis, which, practically always, is accompanied by a certain amount of osteitis. Tilley holds this, and I agree with him. There is a third less common affection called cystic degeneration of the mucosa or hyperplasia of the mucosal glands. A fourth, rather less common, disease is ozaena.

The originally infected area in catarrhal sinusitis is the ethmoid, and that must be attacked by establishing better aeration and drainage by a septal resection, and perhaps removal of some enlarged and infected ethmoid cells. The antrum will get well by puncture lavage in practically all cases. In the suppurative type the Caldwell-Luc operation permits the necessary vision of the whole of the walls and the removal of the lining, for cure cannot now be obtained without that removal. It may even be necessary to remove some bone, particularly from the floor and inner wall, as Tilley rightly says. In cystic disease the same treatment is imperative. Many of us have had to remove the lining at repeat operations because of failure of the foregoing procedures. The operation is performed in ozaena because the cilia have disappeared and the foul contents cannot be got rid of without mechanical aid by daily lavage.

In catarrhal sinusitis I do not believe operation is ever necessary—that is, to the antrum; to free the ostium and set free the cilia is all that is required. The inferior opening, if the intranasal operation is done for catarrhal maxillary sinusitis, is faulty, as the cilia work upwards. A recent writer stated that he found that discharges did not come out by the artificial opening, but were carried by the cilia to the natural ostium. That is why Nager of Zurich made the opening into the middle meatus instead of the inferior, even in the Caldwell-Luc.

I wish to protest against this intranasal opening of the maxillary sinus. In the comparatively few cases of suppurative muco-periostitis, generally of dental and not of catarrhal origin, and in cystic degeneration, the Caldwell-Luc operation seems the only rational one.

Puncture lavage with attention to the ethmoid will cure the catarrhal cases. Nager's opening into the middle meatus saves us from two post-operative troubles: (1) interference with the lachrymal duct, with the distressing blowing of tears across the eye when the handkerchief is used; and (2) the neuralgia attending exposure of the dental nerves in the bony walls of the "window" in the inferior meatal wall.—I am, etc.,

Christchurch, N.Z., Aug. 7th. T. A. MACGIBBON.

Fothergill Testimonial Fund

SIR,—In January this year you were good enough to give many friends an opportunity to place before the medical profession an appeal to support this fund and thereby to mark their appreciation of the contribution I had been enabled to make during over thirty-three years to the medico-political and sociological sides of our profession's interests. Whilst thanking you for this courtesy, and also for your subsequent references to the progress of the fund, may I now be allowed an opportunity also to thank all who have so generously responded, whilst at the same time to add some musings?

The number of Local Medical and Panel Committees, of Branches and Divisions of the British Medical Association, of medical societies, and even of insurance committees, as well as of individual subscribers, who have assisted to the success of the appeal has been really marvellous. Certainly unexpected. To all these, as well as to the writers of the large number of letters received direct, I express my sincere thanks and appreciation. I must also include the many unnamed friends—although they are suspect—whose activities through these various subscribing bodies have been so marked. This recognition of voluntary help from the day of the rebirth of the medico-political side of our Association has been a great comfort. One would hope it will be an encouragement also to those who in great number are now taking up the trail to persevere in their quest.

Whilst busy in the medico-political work one had the opportunity to meet or correspond with very many from all parts of our Empire who in most instances now "have passed out of the sight of men." They had the vision and faith that the medico-political and sociological

activities of our Association must become a necessity, not only for all groups in our profession, but also for the State, local authorities, and even those innumerable lay bodies that were arising to interest themselves in one or more aspects of these branches of medicine. This band of voluntary helpers and colleagues made many sacrifices ; they have been an inspiration, and merit our real thanks. It should be possible to place permanently their names and work on record in a historical manner before they become only names to their successors, and eventually are forgotten.

Scientific advance in medicine is retarded unless it be accompanied by an equivalent medico-political and sociological advance to ensure for our profession that reasonable corporate and individual recognition and freedom for expression of personality which is essential for success. Nor should there be in our profession itself any lack of appreciative and sympathetic co-operation between the two groups.

Medical administration ; the formation of so many lay bodies, with the ramification of their activities into the lives and environment of the peoples ; as well as the continuous evolution and gradual revolution in the conduct of medical practice during the past forty years, have developed a system so intricate and detailed that it is no longer possible to rely as heretofore on the voluntary services of a few to keep things on right lines. And yet our Association has seldom, if ever, been caught napping ; very often it has proved to be a pioneer by its intelligent anticipation, building on sound foundations. Who can say what the theory and practice of medicine in these two fields will have become in another forty years under the impact of changing social conditions?

If we are to continue to carry successfully the burden of the responsibility and trust given to our profession to provide a complete up-to-date health service and to co-operate with others in securing a condition of sound public health, then it is necessary for all—including those to whom the political and sociological branches of medicine do not appeal—to gather round and constantly support, cheer, and encourage those whom they have appointed from all groups in the profession and who are giving of their best.

The success of the testimonial has been great ; but it must be owned frankly that the services for which it is a recognition have been made possible only because of the patience, sympathy, co-operation, and companionship of that large band of workers both within and without our profession that one has been allowed to assist during these many years. All of these, still with us, I ask to be allowed to include in my thanks.—I am, etc.,

E. ROWLAND FOTHERGILL,
Vice-President, British Medical Association.

Hove, Sept. 26th.

*** A final list of subscribers appears at page 634 of this issue.

Universities and Colleges

UNIVERSITY OF LONDON

LONDON HOSPITAL MEDICAL COLLEGE

The Price University Scholarship in Anatomy and Physiology (value £100) has been awarded to D. L. Caldwell of Jesus College, Cambridge ; the Price Scholarship in Science (value £100) to L. Bernstein ; open scholarships (certain subjects of the intermediate and final examinations ; value £100 each) to I. M. Jackson of Trinity Hall, Cambridge, and I. R. S. Gordon of Sidney Sussex College, Cambridge ; *proxime accessit*, H. C. Barry of New College, Oxford ; and a scholarship in arts (value £50) to J. R. Sinton.

Obituary

LORD MOYNIHAN

Professor G. GREY TURNER writes:

When in 1900, as a very young man, I had my first glimpse of Moynihan at work he was well known for his writings on anatomy and was looked upon with a certain amount of awe as an examiner for the Primary Fellowship. But I soon discovered that in Leeds he was already accepted as a very progressive surgeon marked for the natural succession in the line of distinguished surgeons which had begun with the Heys and was at that time so worthily maintained by Mayo Robson and Littlewood. It was true that I had heard of his surgical work from Rutherford Morison, who had known Moynihan from the outset of his career and early appreciated his great talents, but I had scarcely expected to find how highly he was already thought of in his own school.

Shortly I was to have the experience of being examined in anatomy by him, and after all these years look back on that occasion with pleasure and can remember almost every incident of the viva, which was a very stimulating experience. But it was at the B.M.A. in Leicester in 1905 that I first had the privilege of meeting him on a different footing. Mr. Rutherford Morison had asked me to prepare a series of specimens illustrating what he called the " natural cure of gall-stones," and I happened to be about when Moynihan was examining them. He was delighted with the preparations, and asked Morison's permission to have some drawings made for a forthcoming new edition of his book on gall-stones. My old chief gave me all the credit for the beauty of the specimens and introduced me to Moynihan, and there and then began an association which soon developed into a friendship which only death has severed. He was always extremely kind, and I knew that in any perplexity I had only to appeal to him for help, which would be freely given.

It was at the end of the same year that I paid my first formal visit to his operating theatre in the Leeds Infirmary. The notes of that occasion are before me, and I am reminded of his patience, calmness, and gentleness—qualities which he himself expressed years afterwards when he wrote that in operating " the surgeon's every touch should be as a gentle caress." He talked very nicely about his senior, Mayo Robson, who had then migrated to London, and said that in him the surgical instinct was very well developed. That afternoon he did two gastric and two gall-bladder cases, and each operation was a beautiful piece of artistry which I shall never forget. Since that time I have often seen him at work, not always in the abdominal field, and have ever been struck by those same qualities of gentleness and finesse which impressed me so much at my earlier visits. When in the next year I paid the first of several visits to the United States I was to learn the tremendous impression that Moynihan had made there ; the Americans took to him at once, and the regard was mutual, for most of the well-known surgeons of that country have been his fast friends this last thirty years. It was in July of 1909 that Moynihan invited to Leeds those of his friends who had agreed to join him in founding a travelling surgical club. I was fortunate enough to be a guest at that meeting, and had the privilege of being among the original members of the club and its first secretary. Having had the advantage of knowing both worlds, so to speak—that is, before there was any organized means of bringing surgeons together and after—I can appreciate to the full the enormous benefit this club has been

to British surgery and to surgeons. By its means many who might never have done so have been induced to visit one another and to travel abroad to see work together, and the benefit has been mutual and untold. It is a fitting tribute that the original club should still exist, now under the founder's name, with undiminished activity and usefulness. There are many who think with me that the establishment of this club and its nurture during its early years was really the best piece of work which Moynihan achieved.

His early work for the *British Journal of Surgery* was very strenuous, and there are many of us who know what an amount of energy he spent in whipping up contributions during those first days. There were other schemes which he tried to initiate, but they did not always mature, though I never heard him express resentment when they miscarried.

It was not only in professional matters that one had to acknowledge his help, for he was interested in many walks of life, and I am personally grateful to him for sage advice in many directions. His nature was combative ; he loved argument for its own sake, and had a habit of sometimes making *outré* statements just to provoke discussion. In debate he was forceful and often hit hard, but I am sure he never meant to be unkind. In his very full life he had no time to cultivate social relaxation, but when occasion allowed he was most hospitable. Among memorable occasions none who were present are ever likely to forget the banquet he gave to the Council of the College of Surgeons and their wives at the Houses of Parliament, followed by a stroll on the Terrace on one of the most beautiful of July evenings.

Moynihan was intensely proud not only of his own school but of British surgery as a whole, and he was never tired of encouraging his younger friends to strive to make progress.

I feel that it has been a great privilege to have witnessed so much of his work and activities and to have served on the Council of the College of Surgeons during the eventful years of his presidency.

MR. H. L. REES

Mr. C. A. SCOTT RIDOUT writes: The untimely death of Mr. H. L. Rees has caused much regret among his friends at Portsmouth. He was the senior resident at the Royal Portsmouth Hospital for upwards of eighteen months, and worked with me during that time. He was a most willing and pleasant colleague, would do anything for anyone, was a most capable operator, and an expert in handling patients and others who were associated with him in his work. His experience and general surgical knowledge were extensive, and I was personally very sorry that circumstances rendered it impossible for him to return to us after he had taken the F.R.C.S.Ed. Given the right opportunity he had undoubtedly a most successful surgical career ahead of him, and his kindly geniality and professional keenness and zest for hard work would have been of great service to the profession of surgery.

We announce with regret the death, at the age of 52, of Dr. WILLIAM JOHN TAGGART of Belfast. Dr. Taggart graduated M.B., Ch.B., at the University of Edinburgh in 1905. He had been a member of the British Medical Association for many years and worked with the Belfast County Borough Panel, 1931–6. "R. S. A." writes: When he first qualified Taggart worked with Sir James Mackenzie at the Burnley Hospital for two years, and there is little doubt that this experience influenced him afterwards in his conduct of practice. His judgement of cases was extraordinarily good ; nothing was too much trouble for him, and he had the ability of inspiring confidence in his patients to an unusual degree. He settled in practice in the Antrim Road, Belfast, and during the past twenty-five years built up an extensive connexion, becoming one of the best-known and most highly respected practitioners in the city. For a time he held an appointment as honorary anaesthetist to the Royal Victoria Hospital. He was of a quiet and retiring disposition, and took no part in public affairs. He was well beloved by his colleagues for his honesty and sincerity, and his untimely death comes as a sad blow to all those who knew him. Deep sympathy is extended to his wife and children.

Dr. REGINALD JAMES CECIL GLOVER died at Cowark, near Clitheroe, on September 3rd. Dr. Glover studied at Cambridge, Leeds, and St. Bartholomew's Hospital, graduating B.A. in 1920 and M.A. in 1923. In 1926 he took the L.M.S.S.A. and joined his sister Dr. Violet Glover in practice at Bradford. Later he practised in Southport, before settling in Clitheroe. Dr. Glover, who was a Freeman of the City of London, was a member of the Medico-Legal Society and a prominent freemason. His untimely death, at the age of 41, after a brief illness, will be regretted by all his patients and friends, to whom he was familiarly known as "Doctor Jim."

WILLIAM GERALD RIDGWAY died at the City of Dublin Hospital on September 9th, at the age of 50. He took the L.R.C.P.I. and L.M. and the L.R.C.S.I. and L.M. in 1909 in Dublin, proceeding to the D.P.H. and the F.R.C.S.I. in 1913. Before returning to Ireland to take his higher qualifications he was medical officer to the Tientsin-Pukow Railway, China, and to the Chinese Red Cross. He was house-physician, and later house-surgeon, at the Adelaide Hospital, Dublin, later becoming resident surgeon at the County Hospital, Roscommon, and honorary surgeon to the Waterford County and City Infirmary. For a short time he was in surgical practice in the Argentine, leaving there in October, 1914, to join the R.A.M.C. He served continuously until 1919, and was severely wounded in 1918 in France. Mr. Ridgway had been a member of the British Medical Association since 1920. A correspondent writes: He was universally popular with all classes, and was much loved by everyone in the county of Roscommon. He married Gwenda, younger daughter of Charles Bagot of Curraghmore, County Roscommon, by whom he is survived. He was buried at the Society of Friends' Burial Ground, Waterford.

The Services

COMMISSIONS IN THE ROYAL ARMY MEDICAL CORPS.

The War Office announces that applications are invited from medical men for appointment to commissions in the Royal Army Medical Corps. Candidates will be selected for commissions without competitive examination, and will be required to present themselves in London for interview and physical examination on or about October 22nd, 1936. They must be registered under the Medical Acts, and normally must not be over the age of 28. Successful candidates will in the first instance be given short-service commissions for five years, at the end of which period they may either retire with a gratuity of £1,000 or apply for a permanent commission. Permanent commissions will be given to officers selected from among those who wish to make the Army their career. Full particulars of the conditions of service and emoluments, also forms of application, may be obtained from the Assistant Director-General, Army Medical Services, War Office, S.W.1.

The King has conferred the Efficiency Decoration of the Territorial Army on Lieut.-Col. J. Kinnear, R.A.M.C., T.A., and Major E. R. Lovell, R.A.M.C., T.A.

The Gilbert Blane Medal for 1936 has been awarded to Surgeon Commander J. M. Sloane, R.N.

Medical News

The inaugural address of the Westminster Hospital Medical School (University of London) will be given by Lord Horder, at Caxton Hall, Caxton Street, Westminster, S.W.1, on Monday, September 28th, at 3 p.m. Academic dress is optional, and tea will be served after the address in the hospital board room.

The inaugural address of the winter session, 1936–7, of the University of Durham College of Medicine, Newcastle-upon-Tyne, will be given by Dr. H. Guy Dain on Thursday, October 8th, at 4.15 p.m., in the examination hall of the college. His subject will be "General Medical Practice."

Mr. Arnold Sorsby will deliver to the London Jewish Hospital Medical Society the presidential address on "Physicians, Quacks, and Medical Institutions of London Jewry since the Resettlement," at 43, Great Windmill Street, Piccadilly, W.1, on Sunday, October 4th, at 8.30 p.m. Supper at 7 p.m.

The inaugural address at the London (Royal Free Hospital) School of Medicine for Women (University of London) will be delivered by Miss Elizabeth Haldane, C.H., LL.D., J.P., in the Albert Levy Hall, Royal Free Hospital, on Thursday, October 1st, at 3.30 p.m.

The annual dinner of past and present students of University College Hospital will be held in the library of the Medical School, University Street, W.C., on Friday, October 9th, at 7.30 p.m., when the chair will be taken by Dr. Charles Bolton, F.R.S. Applications for tickets, accompanied by remittances (tickets 12s. 6d. each, not including wines) should be made not later than October 8th to the dinner secretary, University College Hospital Medical School, University Street, W.C.

The annual dinner of the University College Hospital Medical Women's Association will be held at the Frascati Restaurant, Oxford Street, W., on Friday, October 9th, at 8 p.m., when the chair will be taken by the president, Dr. Freda Kelly. Members intending to be present should notify Dr. A. L. Winner, 4K, Portman Mansions, Baker Street, W.1, before October 6th.

The annual dinner of past and present students of Charing Cross Hospital Medical School will be held at the Café Royal, Regent Street, W., on Saturday, October 3rd, at 8 p.m.

The annual dinner of St. Mary's Hospital Medical School will be held at Claridge's on Saturday, October 3rd, with Dr. J. O. Symes in the chair.

Sir Cuthbert Wallace, K.C.M.G., C.B., will distribute the prizes awarded by the London Foot Hospital School of Chiropody on Wednesday, October 7th, at 2.30 p.m. The ceremony will take place in Manson House, the Royal Society of Tropical Medicine and Hygiene, 26, Portland Place, London, W.1.

The prize distribution and conversazione will be held at the Royal Dental Hospital, Leicester Square, W.C.2, on Tuesday, October 6th, at 8 p.m., when Sir William Willcox will preside. The clinical "At Home" and annual dinner has been arranged for Saturday, November 21st. The dinner will be held at the Trocadero, Empire Rooms, with Mr. J. H. Badcock, F.R.C.S., L.D.S., in the chair.

A series of seven lectures on air raid and anti-gas precautions will be given under the auspices of the Kingston-on-Thames Division of the British Medical Association at the Wesleyan Hall, High Street, New Malden, on Mondays at 8.30 p.m., beginning on October 12th. The fee for the whole course is 7s. 6d., and tickets should be obtained in advance from the honorary secretary of the Division, Dr. Helen Lukis, 52, Kingston Road, New Malden.

The British Red Cross Society has arranged a course of seven lectures and a practical demonstration on air raid precautions for members of the medical profession and trained nurses. The course will be given by Major H. N. Stafford, O.B.E., *M.C.*, on Fridays at 5 p.m., commencing on October 2nd, at 9, Chesham Street, S.W. The fee for the course is 7s. 6d., and entries, accompanied by fees, should be made not later than September 26th to the county secretary, British Red Cross Society, 9, Chesham Street, S.W.1.

The sixth meeting of the Office Internationale de Documentation de Médecine Militaire will be held at Geneva from October 10th to 14th, and there will be several joint discussions with the international committees of the Red Cross and of military medicine. A series of medico-military discussions will be opened by delegates from the various Army health services. For further information application should be made to Colonel Voncken, director of the Office Internationale, Liége, Belgium.

The fourth European Mental Hygiene Reunion will be held under the auspices of the National Council for Mental Hygiene in the Conference Room, Ministry of Health, Whitehall, London, S.W., from October 5th to 8th. The proceedings will be opened by the Duke of Kent on October 5th at 2.30 p.m. The subjects to be discussed include "Mental Hygiene and the Cinema," "Mental Hygiene and the Nurse," and "Mental Hygiene and the School." The Minister of Health will be present at the Government Reception, to be given in honour of the delegates from most of the Mental Hygiene Councils in Europe, at Lancaster House on October 6th. Further particulars and tickets for the reunion may be obtained on application to the secretary, National Council for Mental Hygiene, 76–77, Chandos Street, Palmer Street, London, S.W.

The twenty-fourth French Congress of Medicine will be held in Paris from October 12th to 14th under the presidency of Professor Marcel Labbé. The subjects for discussion will be acute curable meningitis, parathyroid syndromes, and therapeutics of the sympathetic system. Further information can be obtained from the general secretary, Professor Harvier, 1, Rue du Bac, Paris 7e.

The forty-fifth French Congress of Surgery will be held at the Paris Faculty of Medicine under the presidency of Inspector-General Rouvillois from October 5th to 10th, when the following subjects will be discussed: pneumonectomy; results of ovarian grafts; and surgery in diabetes. Further information can be obtained from M. A. Vulliod, 2, Rue de la Seine, Paris, 6e.

The third Congress of French-Speaking Electroradiologists will be held in Paris from October 8th to 10th. Further information can be obtained from the general secretary, Dr. Dariaux, 9 bis, Boulevard Rochevuart, Paris 9e.

The thirty-third Congress of the Italian Society of Obstetrics and Gynaecology will be held at Milan from October 11th to 14th, when the subjects for discussion will be diabetes and glycosuria in pregnancy, and cancer of the body of the uterus. Further information can be obtained from Professor Alfieri, via Commendo 12, Milan.

The thirty-sixth Congress of the French Association of Urology will be held in Paris under the presidency of Dr. O. Pasteau from October 5th to 10th, when the subject for discussion will be congenital anomalies of the renal pelvis and ureters.

The Rumanian Society for Neurology, Psychiatry, Psychology, Endocrinology, and Legal Medicine has organized a congress at Bucarest from October 4th to 7th, when the following papers, among others, will be read: "Psychopathology of Hysteria," by Professor Marinesco; "Cerebellar Atrophies," by Dr. J. Nicolesco.

Lieut.-Colonel S. P. James, C.M.G., F.R.S., retired on August 31st from the position of medical officer and adviser on tropical diseases to the Ministry of Health, which he had held since 1918.

Dr. Isaac Abt, professor of paediatrics, North-Western University School of Medicine, Chicago, has presented his library of 3,500 volumes on diseases of children to the medical school.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

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All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

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QUERIES AND ANSWERS

Facial Eruption

Dr. GLADYS MONTGOMERY (Auckland, New Zealand) writes: I would be very grateful for any suggestions with regard to the treatment of a troublesome facial skin condition. The sweat glands seem to be overactive, and unless under constant treatment the face is disfigured with countless little cream pin-points of greasy-looking secretion. These actually become so offensive in odour as to be an annoyance to the patient. At intervals the face shows a marked, blotchy, acne-like eruption. The skin is never smooth; the enlarged sweat-gland openings give it a coarse appearance. The electric needle has been suggested, but the specialist did not guarantee a cure. Astringent and stimulating lotions have been applied.

Income Tax

Expense of Locumtenent

"FAITHLIE" employs his son as locumtenent, and has claimed to deduct £2 2s. per week for cost of maintenance. The inspector of taxes refuses to allow more than £1 1s. per week, on the ground that no *additional* cost is incurred in connexion with the general expenses of the establishment.

*** The fact that the locumtenent is the son of the practitioner makes no difference, and the inspector's argument would be equally effective or otherwise in normal circumstances. He takes his stand on the ground that only additional costs can be allowed—that is, expenses which would not be incurred if the locumtenent were not resident on the professional premises. In our view that is fallacious; the true basis is the proper sharing of the general household expenses throughout the year. Suppose, for example, that the agreed ratio of private to professional use is half and half, and that the practitioner takes a month's holiday. During that month the practitioner is deriving comparatively little benefit from his establishment, but is still debited with half cost in the accounts. That is correct; but only so long as the expense of providing the locumtenent takes into account not only "additional" expense, but also a reasonable ratio of the general cost of maintenance of the establishment. Otherwise the Revenue would be "getting it both ways."

LETTERS, NOTES, ETC.

The Lonely Underpaid Woman Worker

Consider Her Palaces, by Miss Rosamond Tweedy, is "a study of the housing problem of lower-paid single women workers in London." This booklet is published at sixpence by the Over Thirty Association (109, Great Russell Street, W.C.1), of which the author is organizing secretary, in the hope of stimulating the authorities to make some better provision for this type of worker in new housing schemes. In a short introduction Sir Ernest Simon, who has done so much to improve housing conditions in Manchester, points out that this aspect of the problem has so far been completely neglected. The living conditions of 239 women in middle life, all entirely dependent on an earned income averaging 35s. a week, formed the subject of a special inquiry. The majority of these women were clerical workers, some of them University graduates, but manual workers were also included. The greater number lived in single rooms, chiefly in the central districts of London, rooms which too often were dilapidated, inconvenient, and depressing, and for which the rental was unduly high in proportion to the occupant's income. The author comes to the conclusion that the provision of one-room flatlets for this type of worker, at a reasonably low rental, subsidized either by the State or by local bodies, is an urgent necessity. The possession of a home, however modest, would greatly ameliorate the living conditions of these women, whose lot is often undeservedly hard.

Radiography

Kodak X-Ray Manual (London, Kodak Ltd., 1936) is a useful little production, not a catalogue of apparatus, but a treatise in short compass on the theory and practice of radiography. There are chapters on the *x*-ray generating apparatus, exposure factors, and shadow formation, and then some more specific instruction on the use of intensifying screens, the handling of film, the design of the dark room (with a plea for light and cheerful colours for the walls, not the psychologically depressing black or red), the process of development, and the viewing of the radiograph. The text is assisted by some excellent diagrams conveying instruction on the physics of the subject, often so difficult to grasp without this aid. Frequent reference is made, naturally, to Kodak productions, but all radiographers, and radiologists too, whatever materials and accessories they use, will find many practical suggestions in these chapters.

Empire Health Week

The Health and Cleanliness Council has issued a poster entitled "The Safe Way to Health," which is intended for wide distribution during Empire Health Week, October 4th to 10th. A limited number of specimen copies are available, and application should be made to the Council at 5, Tavistock Square, London, W.C.1.

Medical Missionaries

In the Educational Number of the *Journal* (September 5th, p. 492) we drew attention to the urgent need for medical men and women in the mission fields abroad. We are asked to state that full information on this matter can be obtained from the secretaries of the various missionary societies, from the Recruiting Secretary, Student Christian Movement, Annandale, North End Road, N.11, or from the secretary of the Conference of British Missionary Societies, 2, Eaton Gate, S.W.1.

London College of Dietetics Ltd.: A Disclaimer

Lord Horder desires it to be known that he is not a member of the Advisory Council of the London College of Dietetics Ltd., and is not in any manner interested in or concerned with this organization.

The Theory of Emulsions: A Correction

We regret that the number of pages and the price were wrongly stated in the footnote to the review of Dr. William Clayton's book, *The Theory of Emulsions and their Technical Treatment*, which appeared in our issue of September 12th (p. 540). The book consists of 458 pages and is published at 25s.; not at 12s. 6d.

Corrigendum

Glaxo Laboratories Ltd. ask us to correct an error in the advertisement they supplied and which appeared in our issue of September 12th. The iron content of ostermilk No. 2 was described as being "five pints per million" instead of "five parts per million."

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 48, 49, 50, 51, 52, 53, 54, 55, and 58 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 56 and 57.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 179.